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No. 1360  
Vol. XXVII

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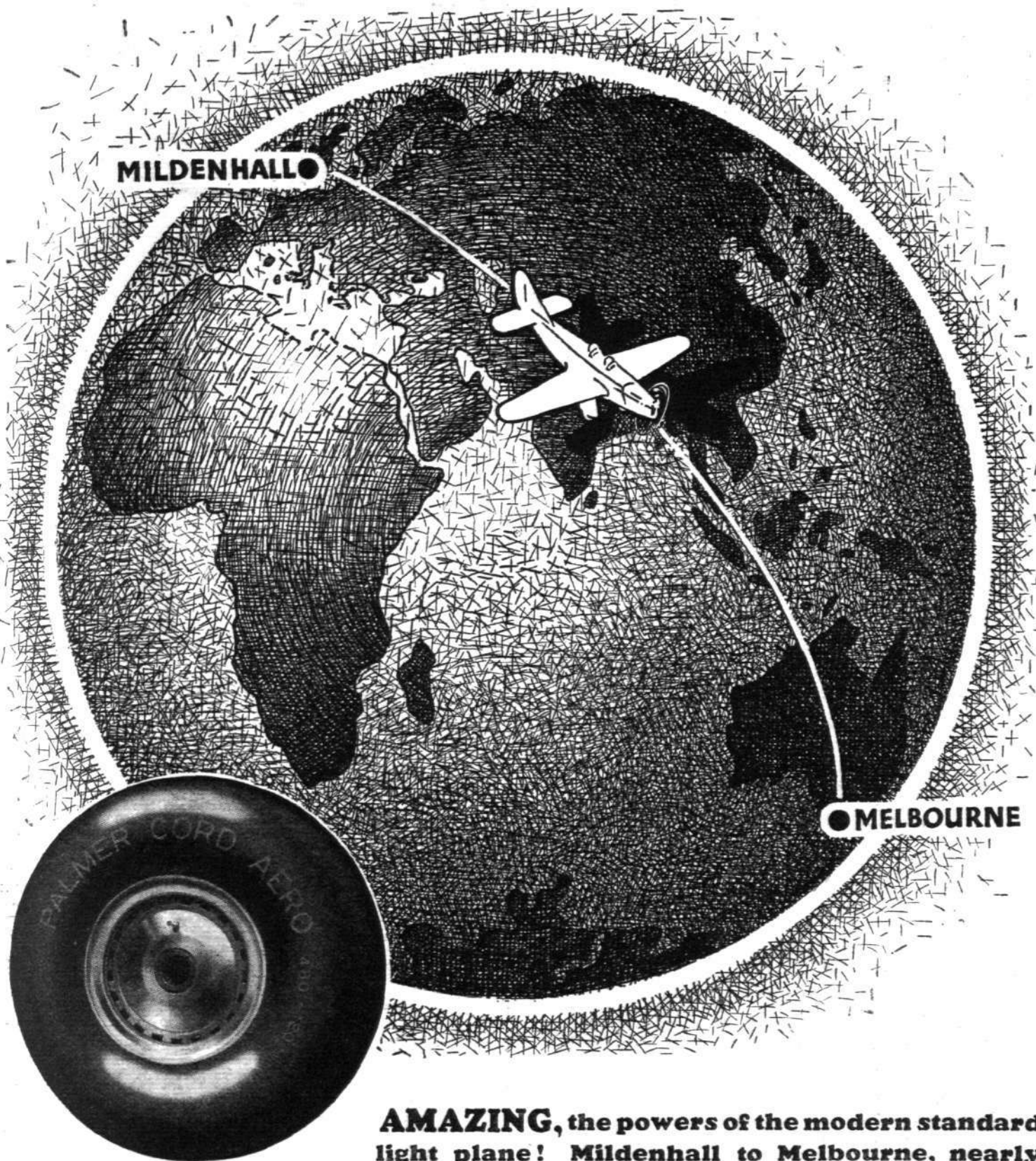
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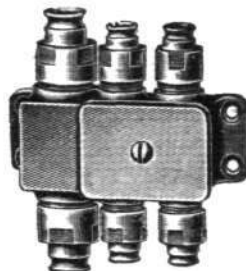
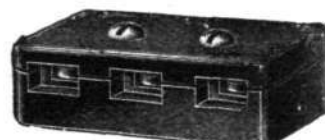
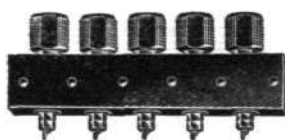
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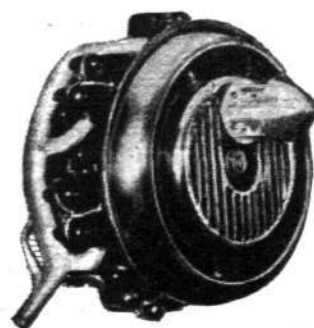
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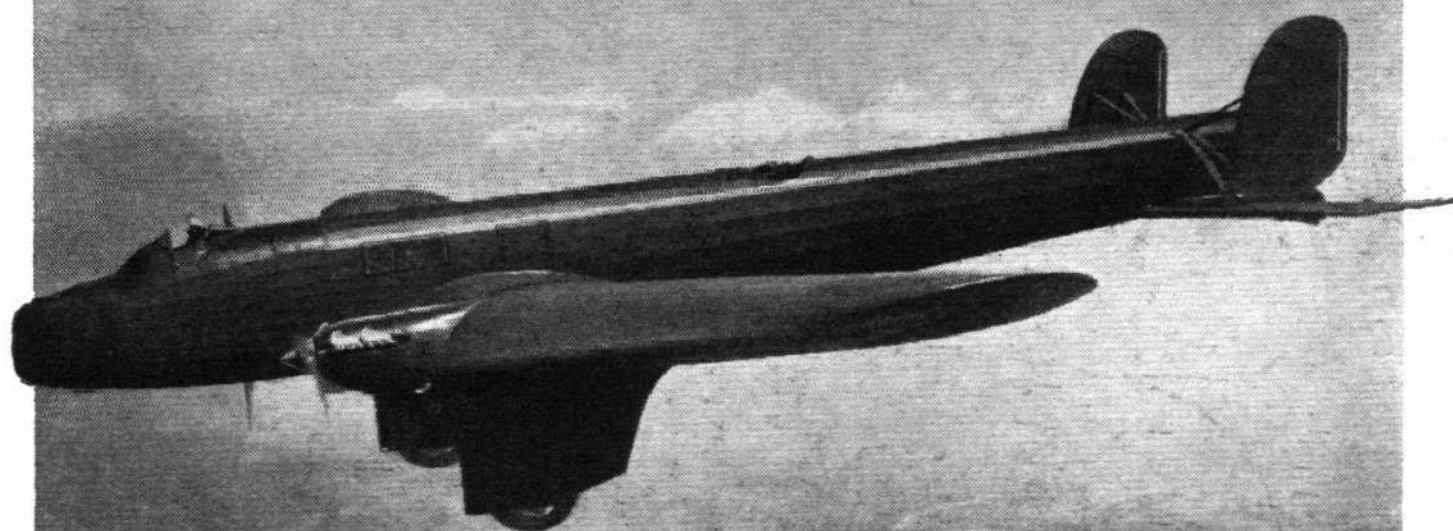


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OFFICIAL ORGAN OF THE ROYAL AERO CLUB

No. 1360. Vol. XXVII.

JANUARY 17, 1935

Thursdays, Price 6d.  
By Post, 7½d.

Editorial, Advertising and Publishing Offices: DORSET HOUSE, STAMFORD STREET, LONDON, S.E.1

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## An Aero Show this Year?

A QUESTION which has been occupying the minds of the British aviation world during the last few months will have to be decided one way or the other in the very near future. It is whether or not we should hold an aero exhibition in England this year. Generally speaking, it is fully realised that the unfortunate experience of 1929 is no guide to what would be likely to happen in 1935. The interest of the general public is vastly greater now than it was then, and it has been stimulated by such events as the England-Australia Race, the improvements recently effected on Empire air routes, the inauguration of through-mails to Australia, and so forth.

An aero show is likely to be expensive if held at Olympia, but it should not be impossible to find a suitable hall elsewhere—one less costly and quite as well situated.

We have ascertained the views of representative members of the industry, and although the general feeling is that past experience has shown that the expenses involved are great, we also discern a tendency to recognise the very great propaganda value which a show would have. Purely from a business point of view the Hendon displays probably fulfil most of the requirements of the manufacturers, but the general public is not admitted to the S.B.A.C. display, and the opinion seems to be that, if the use of Hendon aerodrome could be secured for a further few days and the general public admitted, nearly all the benefits of a "static" exhibition in London would be achieved, and at very much smaller cost. It is not to be expected that the attendance would be as large as that which could be counted upon if the show were held in some large hall in London, but if the latter is found to be out of the question, the extension of the Hendon display might form a workable compromise.

One suggestion which has been frequently made is that the event should be deferred until 1936. In our

view this would be a mistake. In that year France will, presumably, hold an exhibition in Paris. Moreover, an Empire exhibition is to be held in Johannesburg during the concluding months of 1936, at which several firms connected with aviation will certainly wish to exhibit. This conjunction of two events would impose considerable expense, and might make firms disinclined to take part in another show during the same year.

## The Air Transport Conference

THE transport sections of the S.B.A.C., and in particular Mr. Ashley Hall, must be congratulated on the enthusiasm aroused by the conference on air transport which was held last week. The feature of the conference was the paper read by Major R. H. Thornton, which is summarised elsewhere in this issue. It has since been disclosed that this paper was an elaboration of a scheme placed before the Government last August by the Aviation Section of the London Chamber of Commerce.

Major Thornton carries weight, partly because of his trenchant humour, and partly because he speaks without rancour. In proposing reforms, he does not blackguard the Air Ministry or any other party as a set of criminal lunatics. He merely wishes to improve the present situation. He does not wish to infringe the Air Ministry's essential control of the air, but he does question whether the Ministry is the proper party to plan in advance the facilities for inland air transport. There many people will agree with him, and it was evident that the majority of the Conference was in agreement. Accordingly Major Thornton proposed that the Air Ministry should delegate some of its functions to a board with autocratic powers in certain respects, which are detailed on another page.

In many ways the idea is attractive, and it does seem probable that if the scheme is workable at all, it would do more than the present system, or lack of system,

can do for the benefit of inland air transport. Of course various difficulties can be seen in the way, and also certain details of the scheme can be criticised. For one thing, this new board would apparently have to supplant the recently formed Aerodromes Advisory Board, which perhaps might be for the advantage of all. We must also strongly criticise the proposal that the board should be charged with the licensing of the personnel of aircraft which use what Major Thornton called the national airways. We want no duplication, and the present arrangements for the licensing of personnel are quite satisfactory.

The weakest point in the scheme is the finance. Major Thornton said that the board should have the power to raise loans, as at first it would have to work on borrowed money. We cannot help wondering if the prospects of dividends would be so brilliant that the public would rush to lend its money to the board. Major Thornton himself seemed not too confident of this, for he also threw out a suggestion of a grant from the national Exchequer to be distributed by the board. That means another subsidy, and we feel real doubts as to whether the taxpayer wishes to shoulder another burden of this sort for the sake of prospective benefits which are as yet by no means certain. Major Thornton was on much firmer ground when he proposed that the board should receive the computed yield of the duty on petrol consumed in aircraft. The private owners and the flying clubs may object that the national airways are not going to benefit them to any great extent, and that a remission of the tax would be far preferable;

but all are agreed that the tax is unfair. However, the board might start in a humble way by organising one obvious air route, and if that could be done cheaply, the plan may well be worth a trial.

## A Unique Flight

SINGAPORE must have the best of everything. Kipling once called it the "richest roadstead" of the British, and it has grown enormously more important since he wrote those words. The flying boat squadron there needs the latest type of flying boats, and last Tuesday four "Singapore" set out from Pembroke Dock to re-equip No. 205 (F.B.) Squadron there. The pilots and airmen who are taking them out belong to No. 210 (F.B.) Squadron, and this is the first occasion on which new equipment has been delivered by air to an R.A.F. squadron overseas. The flight will cross the plains of Northern India, alighting on lakes and rivers, though the Ganges in the cold weather is but a shadow of its monsoon self. It is rather sad to hear that the four "Southamptons," now at Singapore, are not to be flown home. The cost of the flight would be more than the value of the aircraft. They have done fine work, and now disappear from the charge sheets of the squadron. The "Singapore" have won golden opinions, and will be heartily welcomed by No. 205 Squadron. All will wish Squadron Leader Lang and his merry men a very successful and enjoyable cruise.



THE ARMY'S OPTIC NERVE: A flight of three Hawker "Audax" machines (Rolls-Royce "Kestrel"), of No. 16 (Army Co-operation) Squadron, which is stationed at Old Sarum. An article on the squadron appears on pages 71-73. (*Flight* Photograph.)



# The Outlook

## A Running Commentary on Air Topics

### The Passenger Mind

**A**N inability to "see the wood for the trees" is a stumbling-block in most walks of life, not least among them the aircraft industry. Almost lifelong familiarity with aeroplanes, and a life spent among flying people, seems to blind some designers of commercial aeroplanes to the idiosyncrasies of the public who will later pay money to fly in their products.

For example, how many manufacturers realise that what might be termed claustrophobia often afflicts the average man or woman on entering a cabin aeroplane? It is, of course, a purely psychological effect, induced by years of reading newspaper stories of "passengers trapped amid the wreckage." But the fact remains that it does exist, and the low-roofed, narrow-windowed cabins of some modern machines strongly tend to accentuate it. The obvious palliative is to bring the windows well up towards the roof, or fit roof lights.

### A Matter of Psychology

**D**ESIGNERS are not the only people who are apt to ignore these natural human weaknesses. Even operators, who are (or should be) in daily touch with the flying public, sometimes have an unhappy knack of unconsciously suggesting that air travel is an adventurous business. It is true that many of our foremost concerns have made a close study of this aspect, yet many little things still happen which, while unnoticed by the professional, are apt to bring the public heart into the public mouth.

One example is the bank, unless it be very, very gentle; John and Mrs. Citizen have to make several flights before they can be convinced that an aerodrome building seen swinging between the inter-plane struts is not a prelude to disaster. Another is the business of running-up engines after passengers are on board; we have met more than one passenger who has been quite convinced that a few minutes of throttle-twiddling on the ground was proof of doubt in the pilot's mind as to the engine's reliability.

While air travel is still comparatively in its infancy, we cannot afford to ignore the psychological factor.

### American Service Nomenclature

**W**HAT, *Flight* is continually being asked, are the exact definitions of the American expressions, "Pursuit," "Attack," "Bombardment," "Observation," "Cargo," "Primary training," and "Basic training"? In the main, of course, the actual meanings are fairly apparent, but it is the differentiation between the functions of the various types of aircraft which causes the trouble.

A "Pursuit" machine is what we and the American Navy would call a "Fighter"; the U.S. Navy differs from the U.S. Army on this point. But, even so, the American single-seater "Navy fighter" may be employed as a light dive bomber when it carries about 474 lb. of bombs. The old Curtiss "Hell Diver" two-seaters of film fame, although employed on bombing duties, were classed as fighters.

The "Attack" machine is intended solely for quick, low, surprise attacks on enemy *materiel* and *personnel*. In other words, it is used for "ground strafing" or "con-

tact patrol." Its essential qualities are heavy armament and high performance at low altitudes. A two-seater type, it is used only by the Army.

### Types Within Types

**"BOMBARDMENT,"** of course, needs no definition, although there are various types within the category. The U.S. Navy bombers are usually designed for delivering diving attacks as opposed to the horizontal or "precision" bombing tactics employed by the big twin-engined Army types. The really heavy Army "Bombardment" types are giving way to smaller and faster machines carrying medium-sized bomb loads.

It would be hardly correct to identify "Observation" with our own expression "Army co-operation," for there are two distinct classes of "Observation" aircraft, "Corps observation" and "Army observation." The function of the former types is generally similar to that of our "A.C." machines, and aircraft in the latter class, being larger and more heavily armed, are employed for long-range reconnaissance missions.

What we should call "Bomber transport" types are known in America as "Cargo" machines, although over there they are not necessarily landplanes. Usually, no armament is carried.

"Primary" and "Basic" training are officially recognised expressions, the former implying that the machine is an *ab initio* type, and the latter that it is used for "intermediate" training.

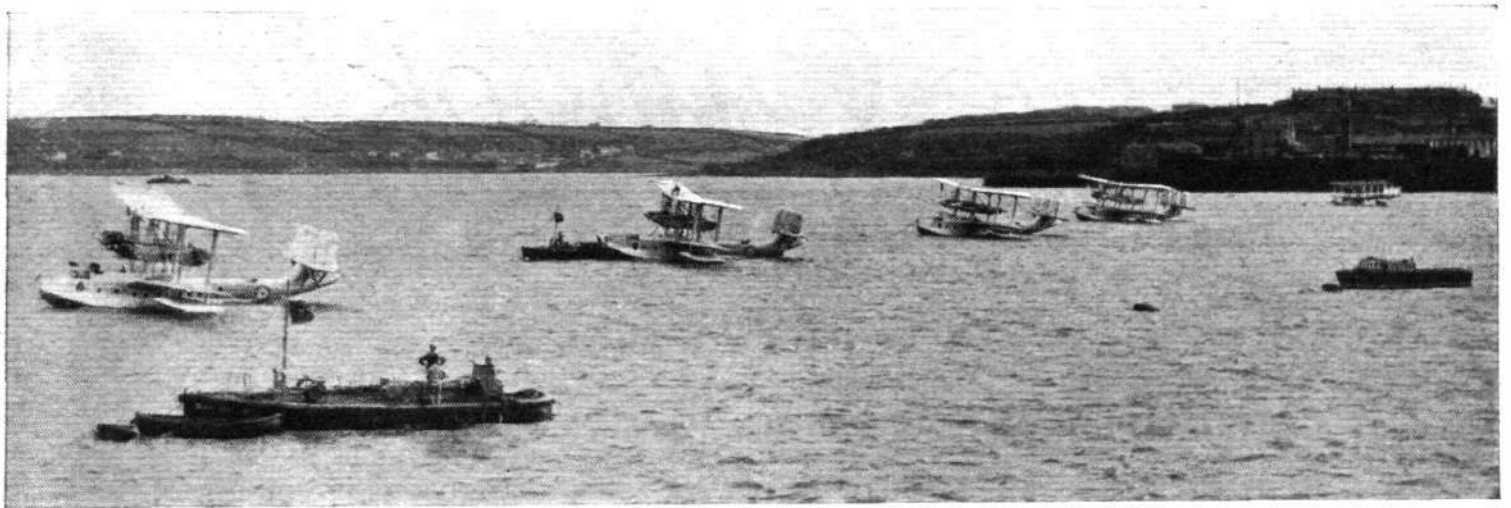
It may be helpful to remember that the initial letters of the titles of the various types are incorporated in the official type designation of the aircraft. For example, Boeing P-26 ("Pursuit"), Douglas O-38 ("Observation"), and Consolidated PT-3 ("Primary training").

### An Irritating Point

**P**RACTICALLY all safety belts in British aircraft, and particularly those used in light aircraft, have a split-pin for securing the quick-release mechanism. This pin is attached to the belt by a ring and cord so that it can be pulled out quickly in an emergency. The cord is secured to the ring by being spliced round a brass thimble. These thimbles are not of the circular kind, but are the pointed egg-shaped ones, and in ninety-nine cases out of a hundred the points become bent outwards almost as soon as the belt is put into service. The result, frequently, is cut or torn fingers. It is only a small point, but its elimination would save a great deal of pain and grief.

### Vertical Landings

**E**VERYONE is interested in the problems affecting vertical landings. Anything which can contribute to our knowledge of this subject deserves to be as widely disseminated as possible, and for that reason designers and pilots should make a point of seeing "The Life Story of the Gannets," a film which is being shown this week at the Leicester Square Theatre, London. The photography is magnificent, especially the slow-motion shots of the landings made by these birds and their dives into the water after fish. Those of the landings might well be analysed, and, together with similar ones which have been taken of bird-flight, made the subject of a lecture before the Royal Aeronautical Society.



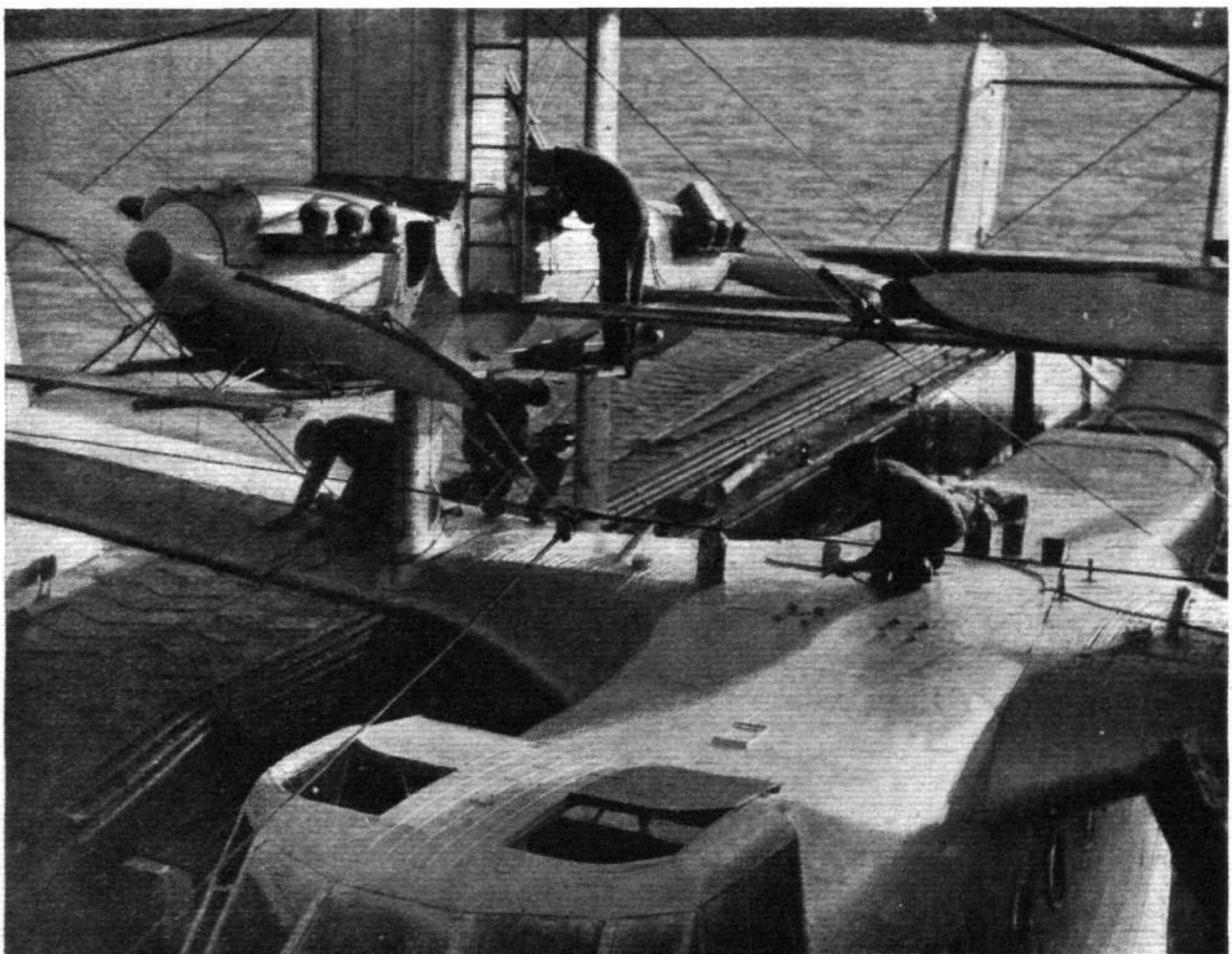
## A NOTEWORTHY R.A.F. FLIGHT BEGINS

*Four Short "Singapore" of No. 210 (F.B.) Squadron Leave Pembroke Dock for the Far East to Re-equip No. 205 (F.B.) Squadron*

A VERY interesting flight, which has no precedent in the annals of the Royal Air Force, started from Pembroke Dock last Tuesday, January 15. It is called a Delivery Flight, and its object is to take out to Singapore Base, which is the headquarters of the Far East Command, four flying boats of the "Singapore III" type with which No. 205 (Flying Boat) Squadron is to be re-equipped.

It will be remembered that No. 205 (F.B.) Squadron came into being by making a great formation flight in four

"Southamptons" under Group Capt. (now Air Com.) H. M. Cave-Brown-Cave. The boats took off from Plymouth on October 17, 1927, and flew by stages right round Australia and back to Singapore, where they settled down as the nucleus of the Far East Command. Since then their "Southamptons" have made many notable flights to Hong Kong and other places in the Far East. The time has now come when the faithful "Southamptons" have to be replaced by something more modern, for it is extremely necessary that everything about our base



The flagship of the Squadron receiving its final attentions on the floating dock. This "Singapore III" had already done some 180 hours' flying, including taking Sir Philip Sassoon out to the Near East. (Flight Photograph.)





(Above) The Captains of the boats: Left to right: Flt. Lts. W. H. Hutton and F. J. Mawdesley; Sqd. Ldr. A. F. Lang, M.B.E., Commanding Officer; Flt. Lt. H. L. Beatty; and F/O W. J. Hickley.

(Right) Sqd. Ldr. Lang at the controls during a test flight. (Flight Photographs.)



at Singapore should be of the best which Great Britain can give. It has been decided to replace the "Southamptons" of No. 205 (F.B.) Squadron with the "Singapore III." The personnel of No. 210 (F.B.) Squadron have been given the task of flying four "Singapore" out to the Singapore Base, handing them over to No. 205 (F.B.) Squadron there. They will return by steamer.

The "Singapore" is a very comfortable boat. In the nose is the usual gun ring with bollards and a sliding trap to keep out the spray when taking off. This gunner's compartment is roomy and contains anchors, ropes, and other tackle. Behind it is the pilots' cockpit, which is covered in to give protection against the weather. The first pilot sits on the left, and is able to adjust the seat up or down. The view is very good, and a hand-operated windscreen wiper keeps the glass clear of spray or rain. Incidentally, the hand-operated model has proved the most satisfactory. Under the seat is the automatic pilot, a device which has been often described in *Flight*. It will take over the control of the machine and keep it on a given course at a given height, and is particularly useful when visibility is bad. All petrol cocks, jettison valves, and controls are situated very conveniently. The valves can be varied for different rates of discharge. The hull proper can be divided into three compartments by pulling down two

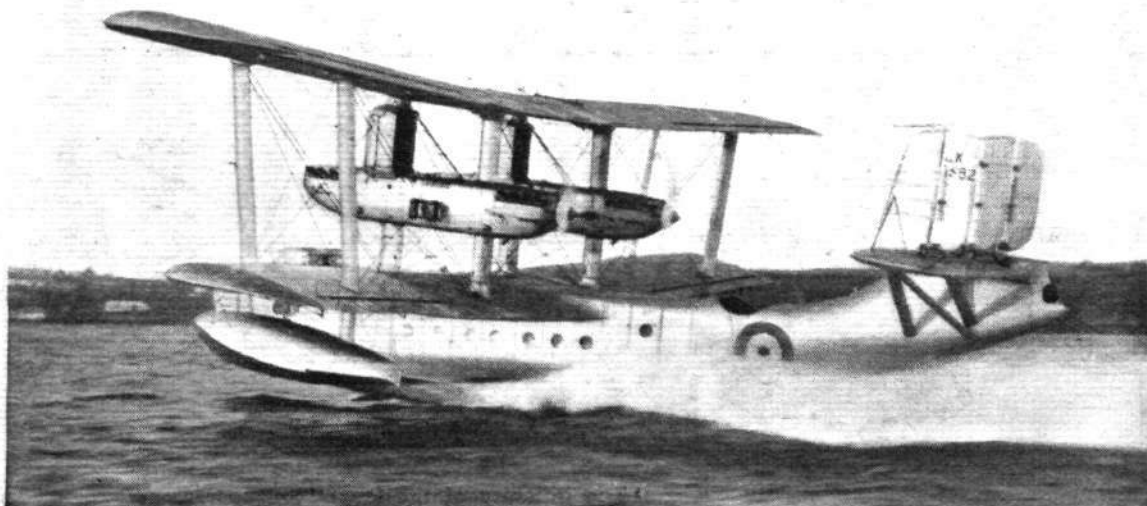
### SHORT "SINGAPORE III"

Four 560 h.p. Rolls-Royce "Kestrels"

Type:	Longe-range	Reconnaissance	Flying Boat.
Length ...	...	...	64 ft. 2 in. (19.52 m)
Wing span:	Upper	...	90 ft. 0 in. (27.4 m)
	Lower	...	76 ft. 0 in. (23.2 m)
Wing area ...	...	...	1,834 sq. ft. (170.5 m <sup>2</sup> )
Tare weight ...	...	...	18,420 lb. (8 360 kg)
Fuel and oil ...	...	...	6,275 lb. (2 845 kg)
Military load ...	...	...	2,805 lb. (1 272 kg)
Gross weight ...	...	...	27,500 lb. (12 477 kg)
Max. gross weight ...	...	...	31,500 lb. (14 300 kg)
Max. speed ...	...	...	145 m.p.h. (233 km/h)
			at 2,000 ft. (610 m)
Landing speed ...	...	...	65 m.p.h. (105 km/h)
Ceiling ...	...	...	15,000 ft. (4 570 m)
Range ...	...	...	1,000 miles (1 610 km)
			at 105 m.p.h. (168 km/h)

shutters. In this way a wardroom can be made for the officers, of whom there are two on each boat for this cruise, immediately behind the pilots' cockpit. The navigator has a table in the wardroom and a porthole protected from the wind for taking observations. In the second compartment there is the wireless panel, and there the operator has a seat and desk with plenty of room to work. In the same compartment is the engine control panel where air and oil temperatures are checked, and

One of the "Singapore III's" taking off in a 25-knot wind. The "unstuck run" is very short and the absence of spray noticeable. (Flight Photograph.)





"Ship me somewhere east of Suez": The complete crews ready for the journey. Eight form the complement for each boat. (Flight Photograph.)

controls are provided for opening the radiator shutters. As regards the wireless installation, it is interesting to hear that already two-way communication has been established between Pembroke Dock and Aboukir, and that by a flying boat on the water.

The third compartment houses the galley on the starboard side and the workshop on the port side. Further aft is the second gunner's cockpit. The gunner is able to raise or lower a metal shield, which when raised protects him from the wind. In slots on each side of this cockpit are the drogues (water anchors), which can easily be thrown overboard from here. Aft of this cockpit is a catwalk to the tail-gunner's cockpit, and in the tail are stored a rubber dinghy, two airscrews (pusher and tractor) and various other stores.

The number of the boats and the names of the crew and passengers are as follows:—

K.3593 (flagship).—Sqd. Ldr. A. F. Lang, M.B.E., who commands the flight, F/O. W. J. Hickley, Sgt. (Pilot) J. H. Tee, Flt. Sgt. D. G. Lockhead, Corpl. G. Fairweather, L.A/C. A. Wallace, A/C.1 A. Shirley, Corpl. C. H. Dawson, and (as passenger) Air Com. A. W. Tedder, Director of Training at the Air Ministry.

K.3594.—Flt. Lt. F. J. Mawdesley, R.C.A.F., F/O. H. J. L. Hawkins, Sgt. (Pilot) R. Rudd, L.A/C's A. Cargill, N. Young, B. T. Baker, A. Mullinger, and (passenger) Mr. R. J. Penn, a senior technical officer of the R.A.E., Farnborough.

K.3595.—Flt. Lt. H. L. Beatty, F/O. J. A. C. Forbes, Sgt. (Pilot) H. J. Willis, L.A/C's W. J. Rees and C. N. Allen, Corpl. S. T. Bailey, A/C.1 L. Wogan, and (passenger) Major R. E. Penny, O.B.E., of the Department of Supply and Research at the Air Ministry.

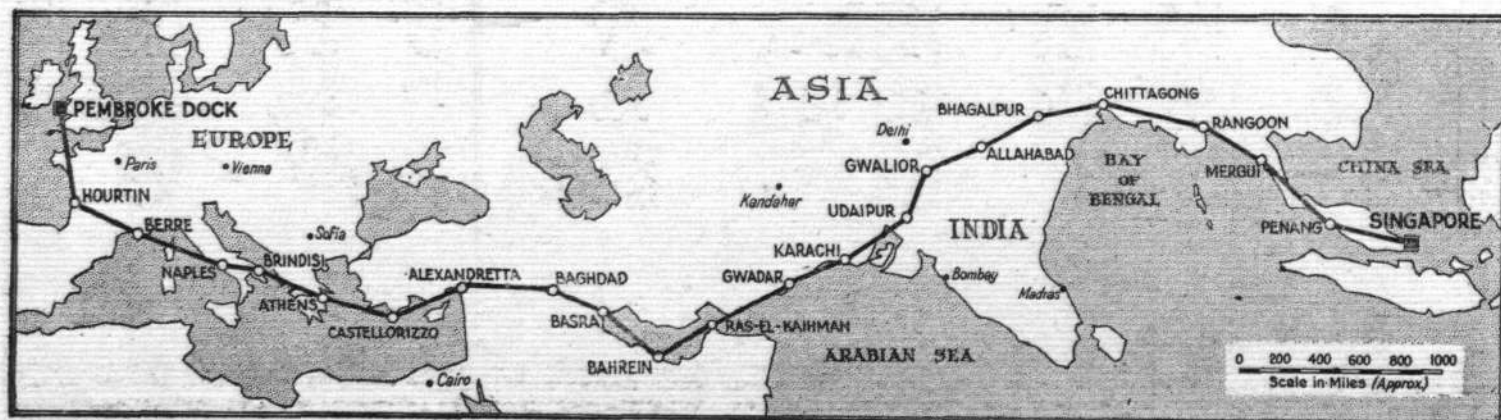
K.3592.—Flt. Lt. W. H. Hutton, P/O. M. D. Thunder, Sgt. (Pilot) W. Bradshaw, Sgt. H. Howard, Corpl. L. Clarke, L.A/C's Howells and J. Stanley, A/C.1 F. A. Warren, and (passenger) Mr. Oswald Short.

It will be noted that two of the boats are carrying nine

persons each, yet the total weight of none of the boats will equal the permissible 31,500lb. Preparing for a flight like this has meant a tremendous amount of work for all concerned, and the officers and airmen of the crews in particular have had a particularly gruelling time getting everything ready. All of them, however, are keen as mustard, and everyone has worked his hardest without a murmur. The men are full of admiration, one might almost say of devotion, for the commanding officer of the cruise, and there is no doubt that the crews of the four boats will, so to speak, be a happy ship. All the pilots are loud in their praises of the "Singapore," and it is a great point in favour of this craft that she is not likely to ship water when taking off.

The itinerary of the cruise is as follows:—

	Sea Miles.	Date.
Pembroke Dock to Hourtin (Bordeaux)	460	Jan. 15
Berre (Marseilles)	327	" 16
Naples .. .. .	450	" 18
Brindisi .. .. .	284 or 521	" 22
Athens .. .. .	352	" 23
Castellorizzo (Rhodes)	327	" 25
Alexandretta .. .. .	320	" 26
Baghdad .. .. .	450	" 27
Basra .. .. .	243	" 29
Bahrein .. .. .	300	Feb. 5
Ras-al-Kaimah .. .. .	350	" 6
Gwadar .. .. .	380	" 7
Karachi .. .. .	250	" 8
Udaipur .. .. .	380	" 13
Gwalior .. .. .	245	" 14
Allahabad .. .. .	231	" 15
Bhagalpur .. .. .	270	" 18
Chittagong .. .. .	320	" 19
Rangoon .. .. .	530	" 20
Mergui .. .. .	300	" 27
Penang .. .. .	470	" 28
Singapore .. .. .	360	Mar. 2



The itinerary of the four "Singapore."





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# THE FOUR WINDS

ITEMS OF INTEREST FROM ALL QUARTERS

## Kingsford-Smith Returning

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From "Flight" of January 15, 1910.

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# AIR OPERATIONS AT SEA

## *Relative Efficiency of Ship-borne and Shore-based Aircraft : Points from a Royal United Service Institution Lecture*

**I**N the course of a lecture given before the Royal United Service Institution on January 9, entitled, "Some Aspects of Air Operations at Sea," Com. R. N. Ellis, R.N., pointed out in the first place that the organisation of the Fleet Air Arm had not as yet stood the test of war. He then enlarged on the main differences between ship-borne and shore-based aircraft. Their problems were, he said, very different indeed.

As regards the influence either could exert on a naval action, the ship-borne aircraft could start their operations in the vicinity of the action, as they were brought to the scene of that action by carriers, whereas the shore-based aircraft were limited in their range of action; there were, therefore, obviously likely to be many actions at sea which they could not reach. Generally speaking, ship-borne aircraft were smaller and carried smaller loads than shore-based aircraft, owing to the limitations imposed on them by virtue of their having to operate from and be housed in a carrier, whereas the shore-based craft not only allowed the designer greater scope but provided a far greater concentration of force.

Com. Ellis pointed out that this fact has been seized upon by the daily Press, who suggested that ship-borne aircraft were therefore of little value, whereas the truth undoubtedly lay somewhere between the two cases.

### Cumulative Damage

Dealing with the effect of numbers in a Fleet action, Com. Ellis said that an increase in the number of the aircraft taking part produced an increase in the effective damage they could inflict which was proportionally greater than the actual increase in the numbers of the aircraft. He pointed out that rapid successive attacks by several squadrons would have the effect of cumulative damage to enemy ships, in so much as the repair parties in those ships would not have time to do their work between the attacks, and that the damage inflicted by the final attack would have a far greater effect than the damage of the earlier attacks.

Turning to the question of gaining air superiority, which he stressed as one of great importance, he pointed out the necessity for early tactical action either (a) by means of damaging the enemy carriers so that their aircraft would be ineffective, or (b) by means of fighter attacks on the enemy reconnaissance machines, which would not only prevent them making offensive torpedo or bombing attacks, but at the same time deprive them of their reconnoitring powers. He also explained how the number of aircraft required to search an area adequately increased enormously when the area itself was enlarged. As an example, he quoted the case of an area 130 miles by 80 miles which would take five hours to search, with an expenditure of 60 aircraft flying hours, whereas one of 260 miles by 180 miles would take a total time of 34 hours to search, with an expenditure of 265 aircraft flying hours. He also quoted the following table as showing the comparative strength of aircraft for naval use of the five chief nations:—

	Great Britain.	United States.	France.	Italy.	Japan.
Operational—					
Fleet-borne	1	2.0	0.3	—	1.3
Coast-based	1	2.75	2.25	3.5	2.85
Training ..	1	4.5	1 (about)	1.0	2.8

The above are relative figures, taking Great Britain's totals as unity.

On the subject of gunnery spotting from the air, the lecturer pointed out that great strides had been achieved in development of recent years, but that it was always extremely difficult in conditions of bad visibility, although, perhaps, less so for aircraft than for surface ships. A case where aircraft definitely could spot more efficiently than a surface ship was when the target was end on.

Com. Ellis also had a good deal to say on the question of the defence of mercantile shipping against air attack, and he felt that one could not rule out the possibility of indiscriminate air attack by an enemy against defenceless shipping, although this would be against all the accepted rules of warfare. He did not think that a cruiser which carried aircraft would be more successful against a single enemy raider, because of that aircraft, than would a cruiser without an aircraft, and that for strategical reasons several cruisers would still be necessary to round-up a single raider.

In the course of the discussion Capt. E. Altham, R.N., Secretary of the R.U.S.I., drew attention to the possibility of arming "seadromes" if these were established, and using them as bases for sea-going aircraft.

Rear Admiral C. E. Kennedy-Purvis, Assistant Chief of the Naval Staff, drew attention to the fact that visibility from the air was seldom greater and often less than that from surface ships, and also to the difficulty of accurate navigation in the air when out of touch with the carrier. Both these difficulties he pointed out as being most important when discussing air operations at sea. He also said that modern high-angle gunnery development had been very great, both for short and long ranges, and that this fact had to be taken into account when estimating the possible damage of attacks from the air. In the case of dive bombing, he said, the machines were virtually flying down the muzzles of the guns. Constructional safeguards against damage of capital ships had also been developed very highly.

In conclusion, Rear Admiral Kennedy-Purvis said—and he did so very forcibly—that all the problems of the air at sea were essentially the problems of Naval tactics, and entirely different from those of shore-based aircraft, and for that reason were far better studied and dealt with by Naval Officers than by others.

### ROYAL AERONAUTICAL SOCIETY LECTURE

On Friday, February 8th, Mr W. C. Clothier, M.Sc., will lecture on "Ice Formation in Carburettors and Induction Systems," and will illustrate his lecture with a number of slides. Briefly, the paper will deal with the causes of ice formation and the atmospheric conditions likely to promote freezing, and the prevention of ice formation. The lecture will be held at 6.30 p.m. at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment.

### WOMEN'S ENGINEERING SOCIETY DEBATES

A series of unusual debates on subjects of aeronautical interest has been arranged by the Women's Engineering Society, and will be held at 20, Regent Street, London, S.W.1, at 6.30 p.m. on January 22, February 12 and 26, March 12 and 26, and April 9. For the opening debate of the series, Mrs. Mollison, the President of the Society, is proposing "that record-breaking flights no longer serve a useful purpose"; the motion will be opposed by Mr. J. A. Mollison.

Season tickets at 5s. for members, and 7s. 6d. for non-members, or 1s. and 1s. 6d. respectively for single meetings, can be obtained from the Secretary of the Society at the above address.



The S.B.A.C. Conference**PLANNING for the FUTURE**

*The Problem of Air Traffic Control : Major R. H. Thornton, M.C., M.A.,  
Introduces a Complete Plan whereby a Special Board would Take  
Charge of Air Route Development*



A group of those who attended the Air Transport Conference, photographed at Heston, where they had lunch on Saturday.  
(Flight Photograph.)

**L**AST week, on Thursday, Friday and Saturday, January 10, 11 and 12, the Air Transport Section of the Society of British Aircraft Constructors held its first conference. Some 200 delegates gathered at

Grosvenor House, London, including many representatives of municipalities, and the proceedings were opened by Mr. Herbert J. Thomas, Chairman of the S.B.A.C., Mr. W. D. Roberts, of Spartan Airlines, and Councillor R. Ashley Hall, of Bristol.

Papers were read by Major R. H. Thornton on the problem of air traffic control; by Mr. C. V. Allen on the legal aspects of airline and airport operation; by Mr. H. R. Gillman on the existing laws and regulations of national and international control of civil aviation; and by Mr. H. N. St. V. Norman on the organisation of airports and aerodromes.

An official dinner was held at 8 p.m. on Thursday at Grosvenor House, and on the last day of the conference both Heston and Croydon were visited by the delegates.

In introducing the first paper—that on the problems of air traffic control—Major R. H. Thornton opened on a note of apology, which was proved to be totally unnecessary by the sheer value of the paper which followed. He explained that, as an amateur, he might be better situated to correlate the rival views of the knowledgeable experts. He had no axe to grind and could be as provocative as he pleased.

The primary question was: Did they consider the Air Ministry responsible for the advance planning of air routes and did it regard itself as responsible? Was its function to anticipate or to control? Many considered that both

these functions were proper to the Air Ministry, but, so far, no announcement had been made. He could find little evidence of advance planning on a national scale, and in the North, for instance, aids had noticeably lagged behind air line development.

Advice was available, but the municipal airport owners had not been invited to take part in any co-ordinated plan for air route development. Meanwhile, operators, in an endeavour to keep to a winter time-table, were accepting hazards, and the S.B.A.C. would perform a very valuable service if they formulated a concerted policy.

During the last five years something approaching a revolution had occurred in flying technique. To-day amateur and professional pilots were in different categories, due entirely to the perfection and constant use of what were generally known as "blind flying" instruments. This development of reliable blind flying was of the greatest significance to commercial aviation. Until one could offer the business man reliable transport on ten days out of ten, one could not

expect him to be interested. It was just this ability to fly without reference to a visible horizon which made of that tenth day a flying day, and made possible a time-table with which future business plans could be laid with absolute certainty.

There were three immediate and important consequences of this development:—

1. An adequate service of radio communication, both for navigation and for information, was an essential accompaniment to blind flying technique.
2. If aircraft were to be free to fly under conditions of

**PROPOSED . . .**

**A** NATIONAL Airways Board, on the lines of the London Passenger Transport Board or the Electricity Commissioners, with the following terms of reference:—

- (1) To administer all State-owned civil airports.
- (2) To license all civil aerodromes.
- (3) To equip and administer all ground stations for communication with civil aircraft.
- (4) To select, equip, and administer national airways.
- (5) To license the equipment and personnel of aircraft using national airways.
- (6) To collect dues in respect of aircraft using the airways.
- (7) To make regulations for the control of traffic.
- (8) To make recommendations to the Secretary of State for the issue of general air navigation orders.

#### The S.B.A.C. Conference—

no visibility, then aerial collisions would occur with calculable frequency, unless aircraft movements were controlled.

3. Any system of traffic control would demand from aircraft crews a high standard, both of skill and—more important—of habit and practice, both in radio technique and in sound airmanship. With a few gifted exceptions there would be no place for the amateur pilot in any controlled traffic system. A plane of operations must be found where he could do no harm to any but his fellow amateurs.

The amount of "elbow-room" required by a number of aircraft moving in miscellaneous directions at 150 m.p.h. was considerable, and even with the small traffic and slow speed of to-day the uncontrolled movement of aircraft over half the County of Kent might be regarded as hazardous in conditions of mildly poor visibility. It was impossible to envisage the future of air traffic in Great Britain without at the same time foreseeing some system of rigorous and unified control.

The methods already in force for dealing with this problem in the area between London and the Channel ports were briefly as follows: First, within an area covering Kent and a portion of Sussex no aircraft without radio might fly in cloud and no aircraft with radio might enter cloud without reporting its position and discussing its intended movements with the Control Officer at Croydon Airport. Second, within a smaller zone surrounding Croydon itself special rules came into force when visibility was less than 1,000 yards. Into this zone no aircraft without radio might penetrate without first landing outside and telephoning for instructions. Aircraft with radio had to report their position and await advice.

#### "Canalising" Air Traffic

Major Thornton did not presume to criticise these regulations nor the skill with which they were applied. Their interest lay in the question whether they constituted a sound basis from which to develop a system designed to deal with traffic of greater intensity. He believed that the principle was incapable of large scale development. The Control Officer was faced with the task of visualising a constantly changing three-dimensional picture which was not even correct at any given moment. For the crew in an aircraft in or above cloud only knew for certain its height. The "open sea" analogy would not work, and Major Thornton was convinced that the whole of the scheduled air-line traffic must be canalised into lanes marked by radio range beacons and divided into "one-way" height levels. These levels, except in the vicinity of an airport, where they might be in constant application, would be brought into force by an "order of the day," when cloud conditions on any section of the route demanded it. When in force they would never be lower than 2,000ft., except within the approach zone of an airport. It was in this lower stratum that private flying would be carried on in machines which would doubtless be capable of maintaining horizontal flights at speeds down to 10 m.p.h.

What was the intensity of inland traffic going to be? In its present undeveloped stage they could clearly foresee certain principles of its development. First, it should never be forgotten that speed in the air was relatively cheap. Speeds, therefore, would increase materially. Secondly, units of small carrying capacity were not necessarily uneconomic, and frequency of service was a factor almost as important as speed. It could not safely be assumed that flying services between, say, the Midlands and London would never compete with fast railway expresses. What would be the response to an hourly service between Manchester and London travelling at 200 m.p.h.? It would be a rash man who prophesied that the response would be nil and the result bankruptcy.

In such circumstances some form of organisation on a national scale would have to be set up, with far-reaching

powers and duties, to deal with the traffic involved. Traffic throughout the whole length of each air route would need to be controlled by a unified routine in which all ground personnel had been trained, and with which all pilots were familiar. The departments of State were not normally regarded as suited, either in constitution and personnel, or in their close dependence upon Parliament, to assume responsibility for the development and continuous maintenance of large-scale public services. Some form of statutory, self-governing Board, such as the B.B.C., the London Passenger Transport Board, or the Electricity Commissioners would be needed. A Board of this kind had been foreshadowed last August in a memorandum presented to the Government by the London Chamber of Commerce.

#### A National Airways Board

Major Thornton then gave a rough outline of what he considered might be its constitution and functions.

It would consist of three or four members each appointed by, and responsible to, the Secretary of State for Air with a limited term of office—not less than five years. Within its terms of reference from the Air Ministry the Board would be a self-governing body corporate with powers to: (a) Make by-laws. (b) Raise loans. (c) Levy dues. Its Terms of Reference would be: (1) To administer all State-owned civil airports. (2) To license all civil aerodromes. (3) To equip and administer all ground stations for radio or other communication with civil aircraft. (4) To select, equip and administer airways as required for civil air traffic. (5) To license the operating equipment and personnel of aircraft using national airways. (6) To collect dues, on a scale approved by the Air Ministry, in respect of aircraft using national airways and radio-equipped aircraft. (7) To make regulations for the control of traffic. (8) To make recommendations to the Secretary of State for Air for the issue of general air navigation orders.

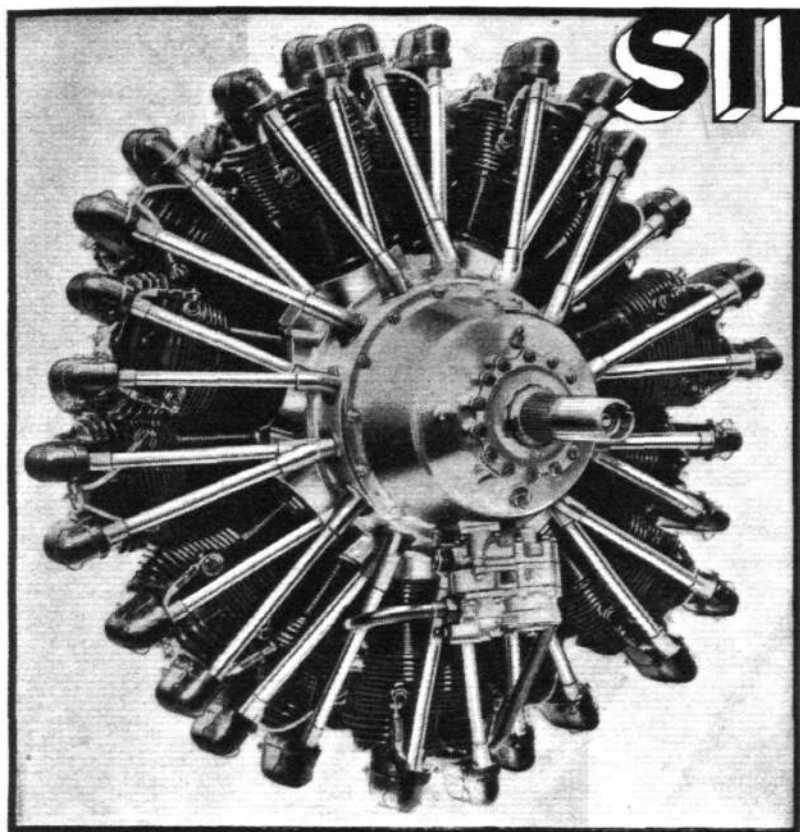
The Board would be assisted by an advisory council representative of the Air Ministry and other Ministries, the Post Office, local government authorities, commerce and industry, the air line operators, insurance interests, and anyone who could possibly have a grievance. The Council would be appointed by the Secretary of State for Air and would meet regularly. No by-law of the Board would be promulgated until it had been submitted for discussion and vote at a regular meeting of the Council.

#### A Summary of its Work

Summarising the main implications which arise from the conception of such a Board, these would be:—

1. The essential control of the air, vested in the Air Ministry, would not be infringed. The Ministry merely delegated its powers, within certain limits, to the Board.
2. The Air Ministry would hand over to the Board its present obligations in respect of the administration of State-owned civil airports, the licensing of civil aerodromes, and the provision of civil radio stations.
3. The Board would be invested with additional licensing powers, not to-day in existence, affecting equipment and personnel both of airports and aircraft in so far as these were concerned with a national airway.
4. The main function of the Board would be the selection, equipment and control of individual specified airways, as might appear desirable in its own running survey of the country's requirements and in consultation with operating and consuming interests. These airways might be analogous to the old turnpike or the modern Italian *autostrada*. It would be an offence to use the airway other than in an aircraft whose equipment and pilot were licensed by the Board.
5. National air dues might be collected in two forms: By an annual basic tax on radio equipment in aircraft and by dues levied per passenger or unit of freight loaded or discharged at any scheduled airport on a national airway.
6. The relations between the Board and an ordinary





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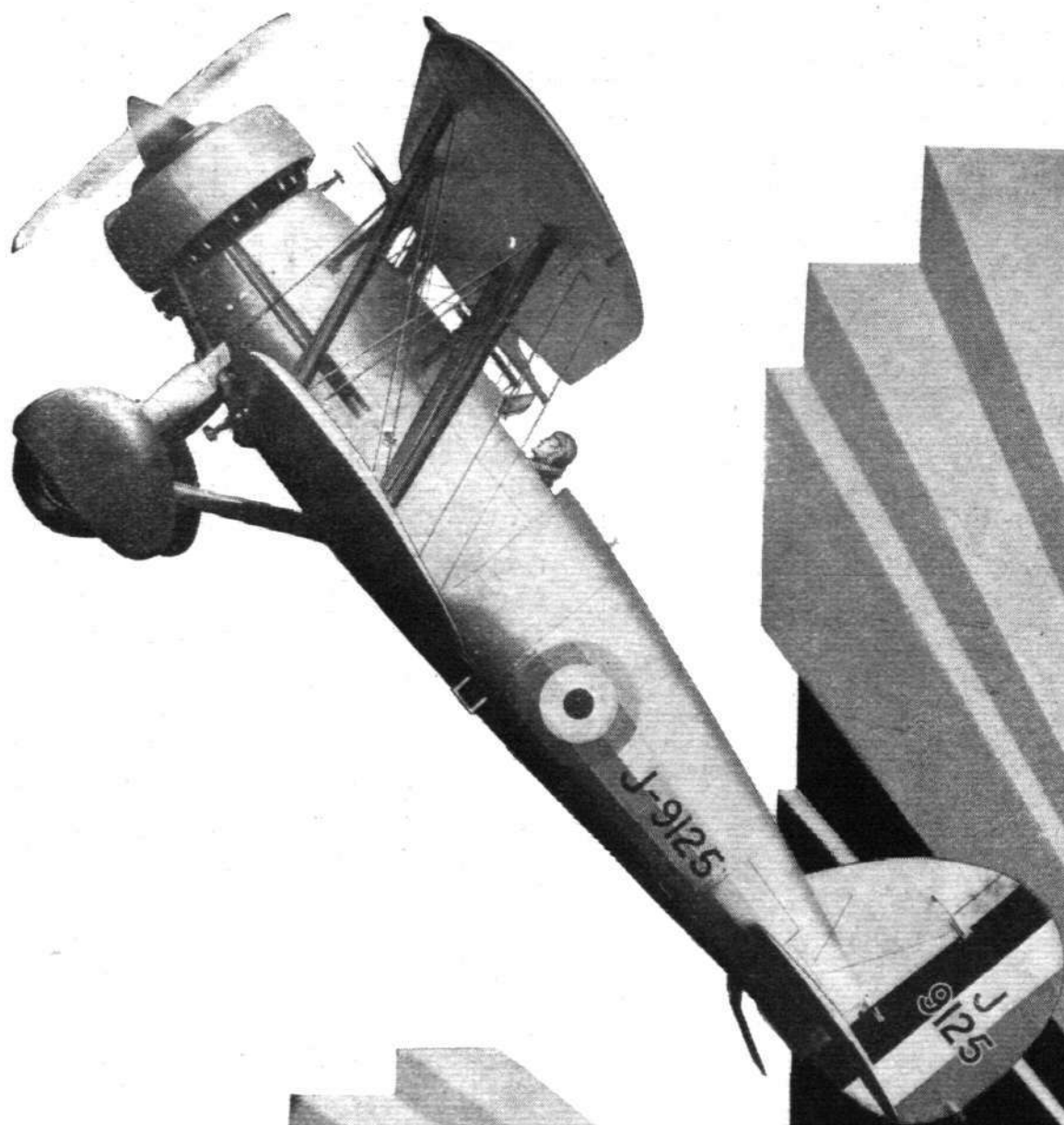
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*A Panther engined Fairey Seal seaplane of the Fleet Arm being placed on its catapult aboard one of H.M.'s battleships.*



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**The S.B.A.C. Conference—**

private or municipally owned aerodrome would remain those of a licensing authority only. But in the case of an aerodrome which was a scheduled airport on a national airway the relationship should be somewhat closer. The control staff should be approved as qualified in airway routine. Aids to approach and landing should be approved by the Board. In addition, the airport would house—and probably for simplicity's sake be responsible for manning—any radio or other beacon that was necessary to the airport as a "mile post" on the airway itself. And, finally, the airport authority would be responsible for the collection of air dues on behalf of the Board. Expenditure under these heads, which might properly be considered to have been on behalf of the airway as distinct from the airport, would be the subject of a grant from the Board.

7. As regards finance, the Board's operations could not in any case hope to be self-supporting until traffic attained considerable dimensions, so that it would need to start on borrowed money. Moreover, if municipalities were to incur the very heavy expenditure involved in purchase and maintenance costs of large airports, they would need to contemplate a more substantial revenue than was indicated in the present conception of airport dues. Further, an airport on a national airway would inevitably serve as a collecting point for a considerable surrounding area. It might well be that the co-ordination of such financial obligations would be more simply achieved by a grant from the national exchequer distributed through the medium of the Board. The exchequer, if His Majesty's mails were to be conveyed by air, could not evade some direct financial obligation towards the maintenance of national air highways. In any event, the Board might well receive, as a primary source of revenue, the computed yield of the duty on petrol consumed. The duty was difficult to defend, and was, in effect, a tax on travel.

**Now is the Time**

In conclusion, Major Thornton suggested that if his solution of the problem was not misconceived it would be the greatest mistake to postpone action on the grounds that a "National Airways Board" appeared a grandiose method of dealing with a problem of relatively small present dimensions. If the Board were approved by the Cabinet to-morrow it would not be in active existence much before 1938. Civil aviation had suffered always from the vicious circle of "wait and see." How could air transport ever become effective without proper organisation? To postpone the measures necessary to ensure regularity until the traffic had materialised would be to put the cart before the horse. There was nothing to prevent the Board, once formed, from starting operations on as modest a scale as possible. Let it, he said, equip and man forthwith one obvious route; e.g., London-Birmingham-Liverpool-Glasgow, with a branch from Liverpool *via* the Isle of Man to Belfast.

**AT THE S.B.A.C. DINNER**

AT the end of the first day's conference a dinner was held by the Society of British Aircraft Constructors. Seldom have we seen such a thoroughly representative gathering of the Aircraft Industry. The speeches were commendably short, but, nevertheless, to the point, and in some cases exceedingly witty, especially in connection with Scotland, where the way of a municipality would appear to be easy, as the cost of land for an airport is so low as to require, comparatively speaking, no thinking about.

The Chairman, Sir John Siddeley, in discussing the question of air transport, said that the first thing operators had to sell was safety, the second comfort, and the third speed. He placed safety first, because he felt that in these early days of air transport development the fewest possible mistakes were wanted.

Mr. G. L. Pepler, a town-planning expert of the Ministry of Health, voiced a plea for a survey of all the conditions

**The Discussion**

Mr. O. E. Simmonds, M.P., after congratulating Major Thornton, spoke at length of the necessity for complete ground organisation, and made special reference to the involved system laid out in the United States. The Parliamentary Air Committee, he said, would support any reasoned proposals put forward by the conference, but that the civil side of the Air Ministry was not particularly endowed with initiative.

After explaining that the short distances and well-developed night mail train services in this country reduced the value of internal air lines for postal purposes, Sir Frederic Williamson, Director of Postal Services, went on to say that the English business houses were beyond measure conservative.

As an instance he cited the case of the arrangements whereby a letter could, if posted early, be delivered in Paris on the same day, and stated that only 20 lb. a day was sent.

Mr. E. C. Gordon England reminded the Conference that the Gorell Committee had recommended the constitution of a board to deal with aircraft licences, and that this was already in process of formation. In a country so small, frequency of service was the important thing.

Mr. R. P. G. Denman, who has only recently returned from a "study" tour of American air lines, stressed the necessity for very cautious development in the matter of radio equipment. Beacons, he said, were not all that they should be, and the proposed board must know what it wanted. The Government was the only body capable of carrying out wireless research work at the present time.

Major Thornton, in reply, claimed that the air transport business was always waiting for a millennium, and that, for the present, the thing to do would be to standardise on the best wireless equipment available.

After several representatives of municipal authorities had asked for further guidance as to the necessity for all municipal authorities setting up aerodromes, Councillor Osmond, of Grimsby, put the suggestion that a municipal sub-committee of the Air Transport Association be formed to deal specifically with the needs of municipal airport operators. This suggestion caused a large amount of discussion, but ultimately the Chairman of the meeting, Mr. R. Ashley Hall—who is chairman of the Airports Division of the Air Transport Section of the S.B.A.C.—put the suggestion to the meeting, and it was carried unanimously.

At this point Mr. Arnold Marsh was given a few moments to spread propaganda for the Smoke Abatement Society, on the plea that the abatement of smoke would materially assist airport and airline operators in this country. There is no doubt that there is a good deal to be said for this point of view.

Replying to the points raised in the second discussion, Major Thornton pointed out that a good deal had been made out of a remark of his about the cost of a first-class airport. He said that when he referred to this as "colossal" he did not wish to infer that every authority need incur the expense of such an airport. Where the traffic did not warrant the establishment of an A1 airport, it would be entirely unnecessary, and the cost would be very much smaller. Moreover, there were many places (such as Brighton, Hove, and Worthing, which were mentioned by one of the speakers) where adjacent municipalities could share the cost of an airport which would serve their several needs.

relating to internal air transport, so that development might be on an orderly basis and so that the aerodromes provided might be worthy of that industry.

Group Capt. W. Primrose, air adviser to the G.P.O., said that there were two main freights on air lines: the first human, and the second mails; both are in a hurry, and both are peculiarly adapted for transport by air. He also said that the G.P.O. was fully alive to, and desirous of taking advantage of, the speed of air transport.

Sir Stephen Demetriadi, Chairman of the London Chamber of Commerce, suggested that the peculiar virtue of the aeroplane was its speed, and unless that virtue was fully exploited the aeroplane would cease to have any advantage over other methods of locomotion. He also deprecated the air mail organisation which rushed the mails forward for eight hours and then, by allowing them to remain motionless for sixteen hours, lost the advantage gained.

*The S.B.A.C. Conference. (Cont.)***THE COMPLETE AIRPORT***Looking Ahead : A Précis of Mr. H. N. St. V. Norman's Paper on the Needs of the Airport Owner, the Operating Companies and the Public*

**I**NTRODUCING his subject, Mr. Nigel Norman explained that the airport proprietor was the key man at such a conference as this. Until fully-equipped airports were provided it was impossible for the airline operator to develop his services, for the individual pilot to use his aircraft, for the sales or service expert to develop his organisation, or for the average man to obtain the benefits that aviation had to offer.

The "air planner," he said, had not yet come into his own, though individual efforts by municipal and private enterprise had already provided a number of aerodromes. Isolated landing points were, however, almost as useless as stations unconnected by rails. Without the additional intermediate facilities which it was beyond the power of the airport proprietor to provide, traffic must be confined to daylight and to good weather.

At this moment the most critical question of all—that of radio communication and navigational aids—was under consideration by the Air Ministry. Perhaps no single item of equipment would exercise such an influence upon the development of air transportation and research in radio direction, and blind landing was, perhaps, less advanced here than abroad. This was a matter demanding the attention of the highest technical authorities. In other respects air routes should be equipped along their length. Emergency landing grounds must be available with specialised communication for meteorological and service purposes. These grounds must be equipped with illuminated wind indicators, obstruction and boundary lights, and identified by beacons. Route beacons would probably be needed at intervals of not more than fifteen miles, and until these essentials are assured, it was scarcely reasonable to expect the airport proprietor to perfect his terminal. A national policy could not be delayed.

Turning to the problems of airport equipment, Mr. Norman believed that proprietors would find it less difficult to provide what was required than to ascertain what was needed. Aerodrome practice was too new to have become standardised, and the lessons of other countries were not entirely applicable to our problems.

**Some Essential Requirements**

In dealing with the needs of various people he would consider: (1) The airline operator. (2) The individual pilot and pupil. (3) The public. (4) The airport tenant. (5) The permanent airport staff.

For the airline operator the most important matter was to sell sufficient seat-miles per machine per annum to make his services self-supporting. His ideal was to be able to operate to 100 per cent. efficiency day and night. The pilot required the landing ground to be large and level, with free approaches and with clear boundary marking by day and night. He preferred a regular shape—preferably a rectangle. He did not necessarily want to be confined to the narrow chain of directional beacons. Instant weather news, a means of locating his airport, and positive guidance for landing would complete his ideal organisation. He required standardised lighting equipment and preferred a beacon that could be seen a good way off and recognised at once among other lights. He would be glad to see the whole landing area brightly lit as he approached and wanted to land more or less from behind a floodlight and fairly close to it without restriction of run. A well-defined boundary and light to show the position of the surface would be as much as he could hope for in bad visibility, and

he depended more and more on his own landing lights for the actual touch-down. Good wind indication was important, since this showed the "rule of the road" on the landing field at any moment. This indication should be such that it gave a clear direction for landing in moments of calm, and should be clearly distinguishable at a distance. On main airports he needed a chalk line to indicate the most suitable take-off run for use in fog conditions, and a large and well-organised tarmac was of considerable assistance.

The pilot needed a place to hand over his papers and receive his instructions, and direct access to the Meteorological Officer. He would be glad of sleeping accommodation and some privacy.

The engineering staff would be doing important and sometimes delicate work in the hangars by day or by night, regardless of climatic conditions, and would not be satisfied with the steel-framed shell of corrugated iron and asbestos. Something more in line with the requirements of the Factory Act was essential, with solid walls, dry floors, well-fitting and easily-operated doors, good lighting, and an annexe to provide office accommodation. Dimensions could not be defined, but a depth not greater than the door opening was desirable. Door height should not be less than one-fifth of the span. The cost of such a hangar might work out at from 10s. to 15s. per sq. ft.

**The Traffic Staff's Work**

The work of the operator's traffic staff might involve weighing and the checking of baggage, the booking of tickets and the making out of the passenger lists and the load sheets for the pilot. Time was of vital importance in these matters, and several sets of scales were an advantage. All the work should be done in or adjacent to a traffic hall used solely for passengers. The avenue for incoming passengers should be distinct from that of the others.

Turning to the case of the individual pilot with whom is included the pupil under instruction and who needs separate accommodation in the form of a club or flying school office, presided over by a member of the permanent staff, Mr. Nigel Norman considered that he or she formed one of an important class of aerodrome client. The accommodation should overlook the landing field and be as close as possible to the private or school aircraft park.

Among the general public he included the airline passenger, who needed simplicity and efficiency. A good drive up and an entrance leading naturally to the circulating area, with the usual "platform" equipment, were essential. He thought that passenger accommodation would be modified in the near future to provide a covered-in area. Passengers will not stay in the Traffic Hall, yet they must be kept under control.

A heavy expenditure was not, however, necessary on the place where a passenger would spend, at most, ten minutes. Waiting friends would appreciate a vantage-point where they could see the aircraft arriving and the passengers disembarking.

The sight-seeing public had never been successfully catered for in this country. At Continental airports thousands of people might be seen watching the aeroplanes and taking refreshment on fine week-ends. Croydon pro-

(Continued on page 79.)

Summaries of two further papers read at the S.B.A.C. Conference will be found on p. 74.



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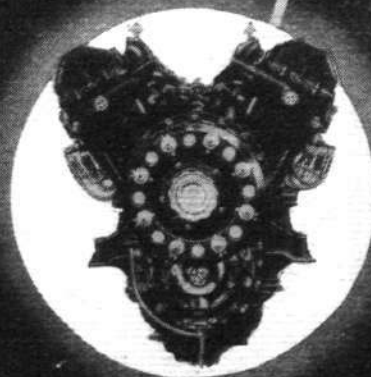
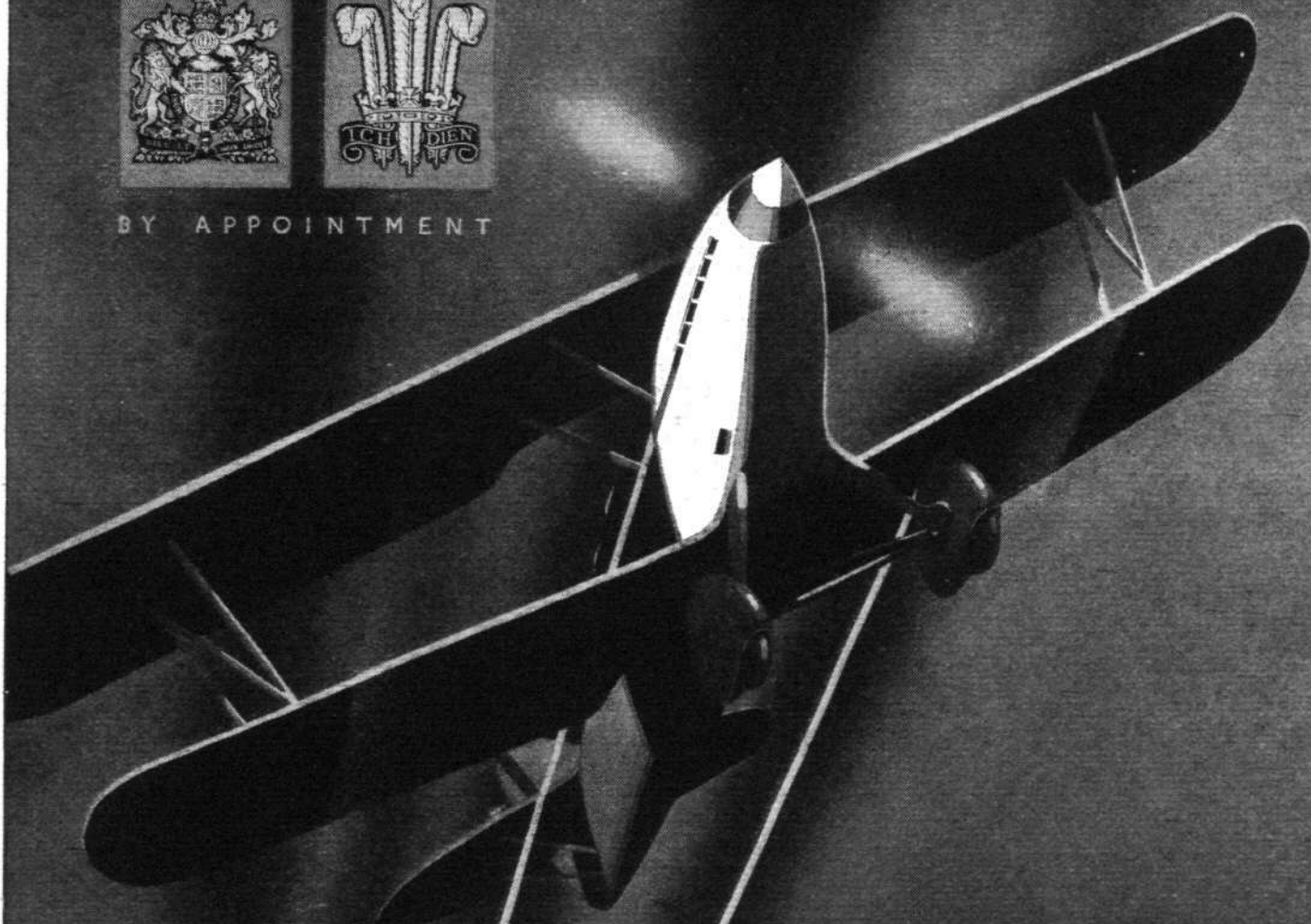


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# On the Plain

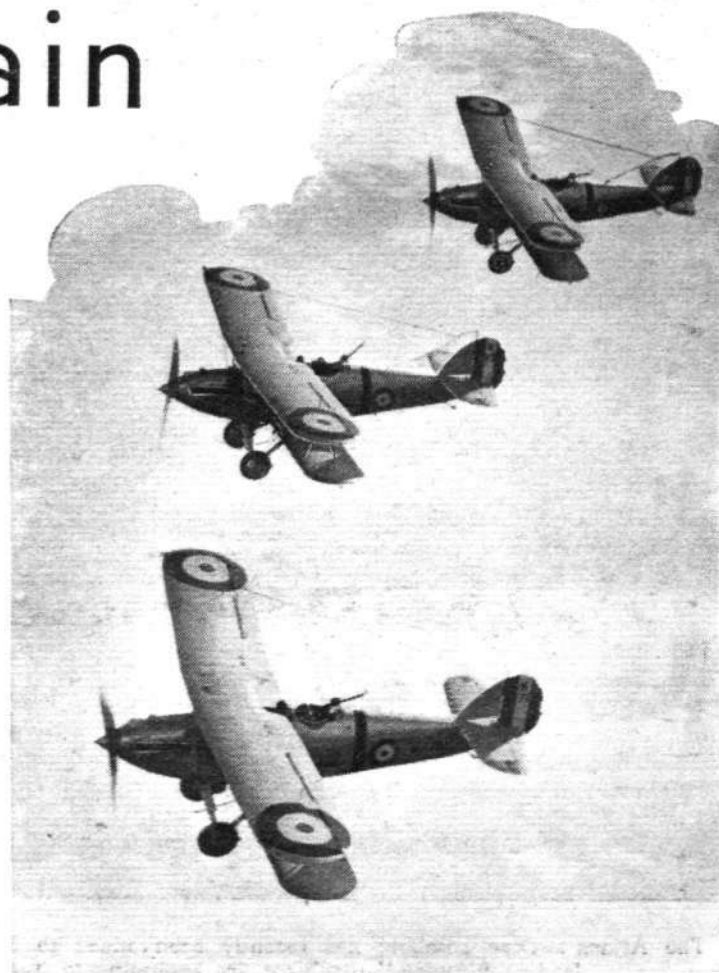


## No. 16 (ARMY CO-OPERATION) SQUADRON

By Major F. A. de V. ROBERTSON, V.D.

IN a recent article on Old Sarum we dealt with the School of Army Co-operation which is stationed there. That station also accommodates No. 16 (Army Co-operation) Squadron, one of the five squadrons in Great Britain which is devoted to work with the Army. It is appropriate that No. 16 should carry on this work, for this has always been its special function. During the war it was a Corps squadron, which implied the same sort of work as is now carried out by an A.C. squadron. Fighting, except in self-defence, was not the job of a Corps squadron, and bombing was only indulged in occasionally. The proper work of such a unit was to reconnoitre, photograph, spot for the guns, and do contact patrols on the front of one Corps.

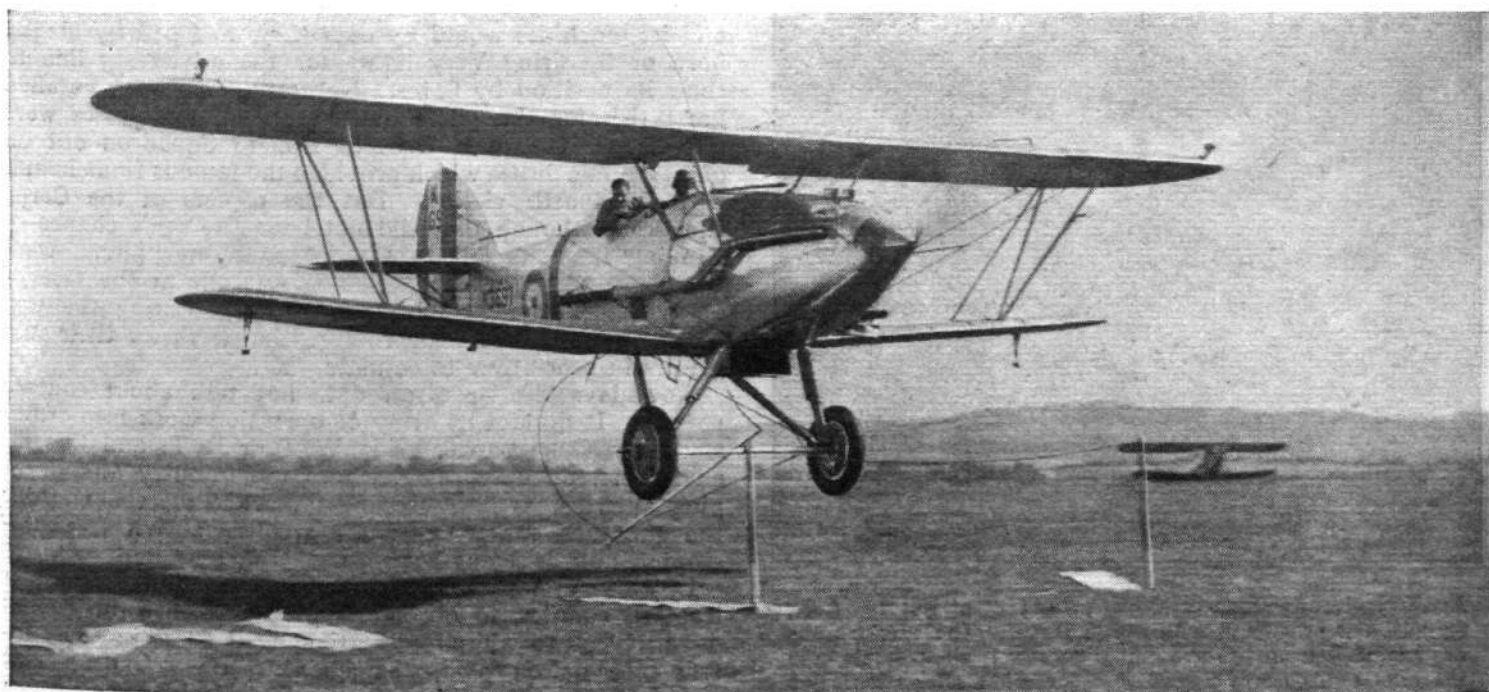
Mostly, No. 16 Squadron was attached to the Canadian Corps, and gave great satisfaction to those famous fighting men. During the battles of Ypres in 1917 (usually called Passchendaele) the G.O.C. 1st Canadian Division reported on the work of the squadron as follows: "Despite the unfavourable weather conditions we were kept well supplied with absolutely up-to-date photographs of the enemy's lines. This was of extreme value, particularly to the artillery. During operations the contact patrol work was done most successfully by this squadron. Perfect



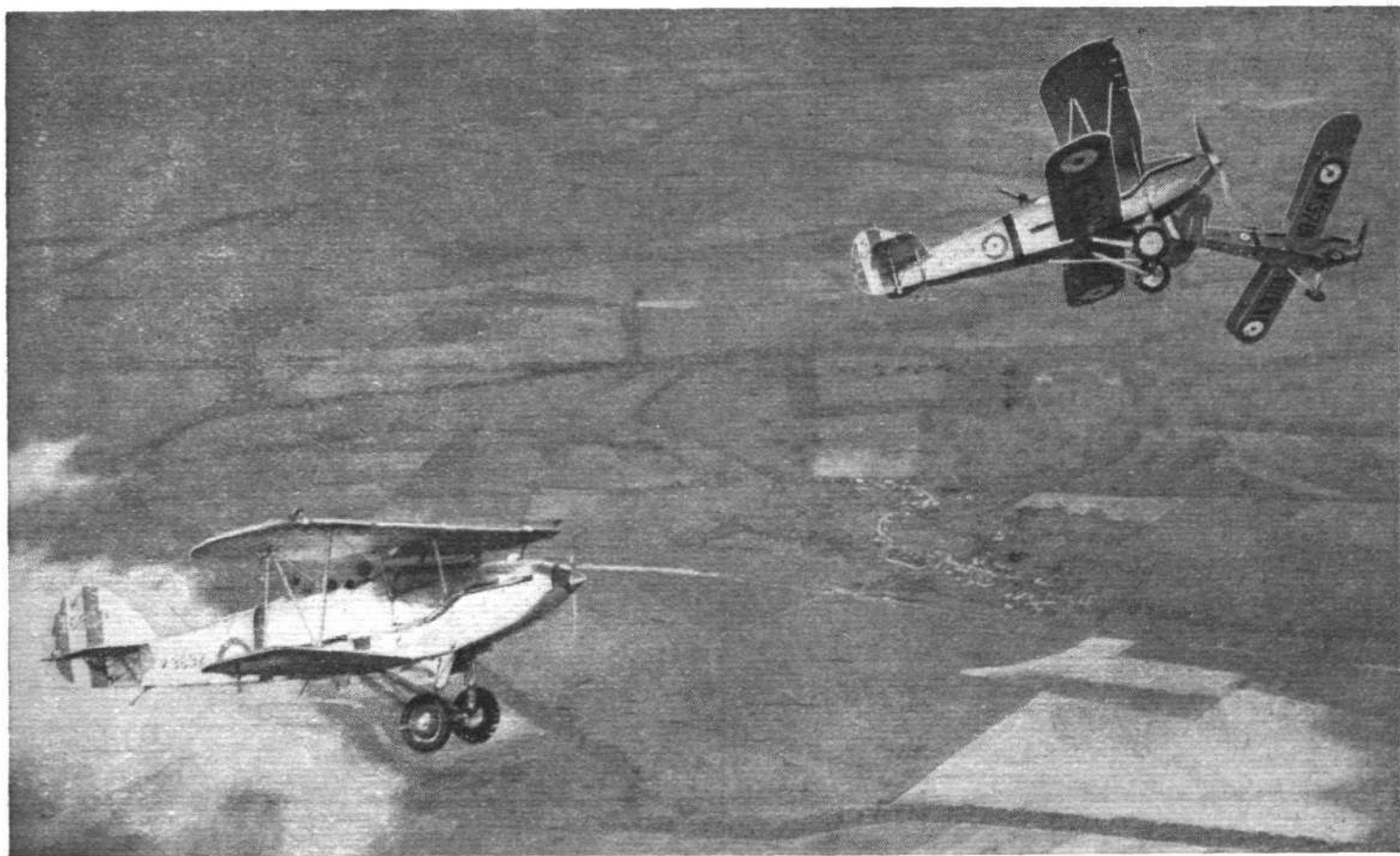
In Echelon: A Flight of No. 16 (A.C.) Squadron Hawker "Audax" machines (Rolls-Royce "Kestrel").  
(Flight Photograph.)

liaison was maintained, and we were instantly informed of the situation."

The squadron was formed early in the war, in February, 1915, by taking flights from Nos. 2, 6, and 5 Squadrons and combining them under Capt. (afterwards Air Vice-Marshal) F. Vesey Holt. Afterwards, the squadron was commanded by Major (now Air Marshal Sir Hugh) Dowding, Major D. W. Powell, Major (now Group Capt.) P. C.

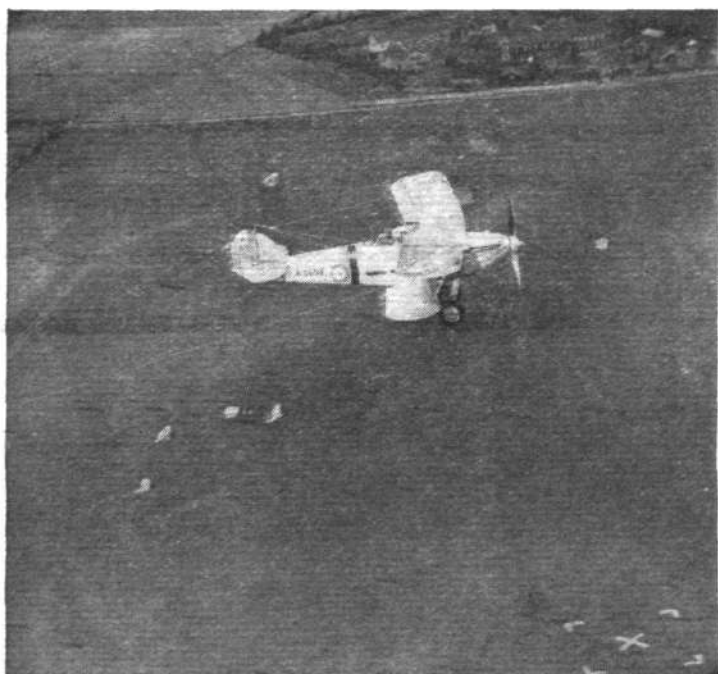


Aiding the Infantry: An "Audax" picking up a message. In field conditions the two posts between which the message cord is extended might be replaced by rifles with fixed bayonets driven into the ground. (Flight Photograph.)



The Attack : Dive bombing has recently been added to the functions of army co-operation squadrons. Here the two leading "Audax" machines are beginning to "cartwheel" in turn into the dive. (*Flight* Photograph.)

Maltby, Major (now Group Capt.) C. F. A. Portal, and Major A. W. C. V. Parr. For the first year of its existence the squadron had the usual assortment of heterogeneous aeroplanes common in the R.F.C. at that time. Then it was given three brands of B.E. (the 2C, the 2D, and the 2E), and from May, 1917, until the end of the war it flew the R.E.8. Since the war it has had the Bristol Fighter,



Artillery Reconnaissance : This "Audax" of No. 16 (A.C.) Squadron is practising with a puff target. The smoke puffs are exploded from the ground to represent shell-bursts, and the pilot sends down a wireless observation after each salvo until he has directed the battery on to the target. This machine is flying comparatively low in order to appear in the photograph. (*Flight* Photograph.)

the "Atlas," and now it rejoices in the "Audax."

The squadron's first important piece of work was in the bloody and ineffectual battle of Aubers Ridge in May, 1915 (the name awakens acute memories in the mind of the present writer), when it made the first deliberate attempt at contact patrol. This meant reporting by W/T to headquarters the advance of the infantry. Three Maurice Farman's were specially told off for this work, and during the battle they sent down forty-two signals. But the organisation of contact patrols was in its infancy, and this first attempt did not inspire the staffs with great confidence. Afterwards, in the battles of Arras, the squadron developed the idea of contact with the infantry, and its machines would fly over them and call by klaxon horn or by firing Very lights for the advancing line to show its position by flares. Naturally, this work entailed great risk for the pilots and observers, and losses were numerous. It was a B.E. of No. 16 Squadron out on photographic duties which provided the famous Immelman with his fourth victim. But the officers of the Corps squadrons, though they did not have the same chance of winning fame as fell to the lot of fighter pilots, were equally resolute in sticking to their work in the face of all risks. The officers of this squadron during the war left a fine record of army co-operation work for their successors in peace-time to emulate.

Nowadays the squadron does not talk about contact patrols. It divides its army co-operation work into ordinary air reconnaissance, using W/T or R/T, and this includes picking up messages from the infantry and dropping answers, artillery reconnaissance (i.e., spotting for the guns and reporting enemy artillery activity), photography, and dropping supplies.

In ordinary air reconnaissance one machine is given a tract of country to observe, and the pilot is instructed definitely as to what information he is to seek. The intelligence liaison officer attached to the squadron first communicates with the Army staff, and gives the pilot a full account of the situation on the ground, amplifying the details of the staff's requirements. The pilot goes out



Strange devices: Receiving one-way messages from the "Audax." The airman in the photograph is attached to the battery which is firing. Strips are laid out as signals to the pilot. (*Flight Photograph.*)

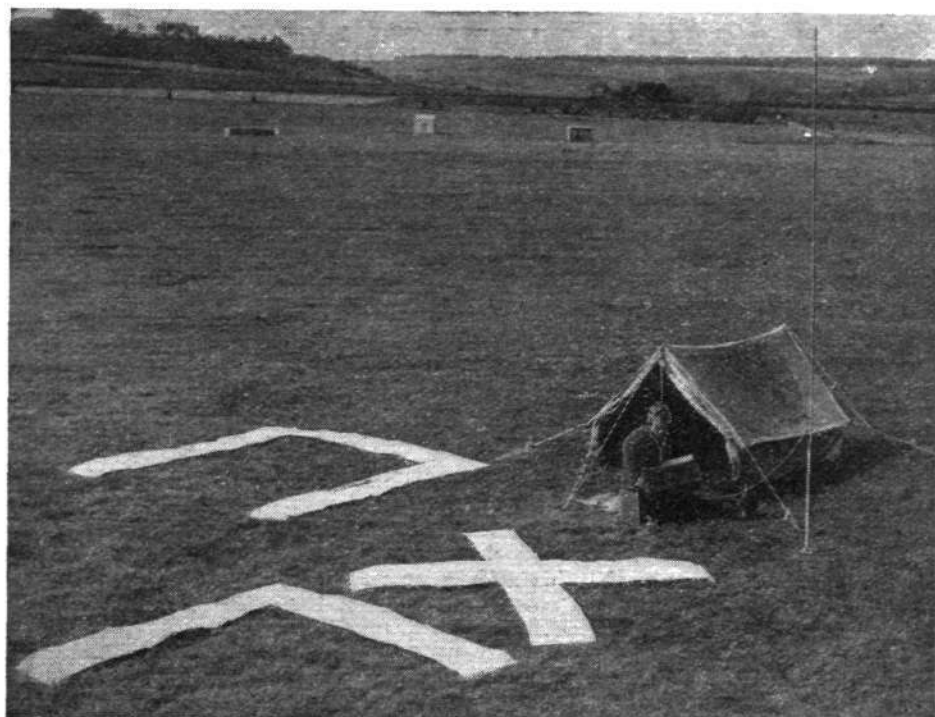
and reconnoitres the whole of his area, looking for positions and movements of the enemy, and sending down wireless reports of all that he sees. At the same time he writes down his own reports, giving the time of each entry. The W/T or R/T messages which he sends down are received by a signaller of the R.A.F. on the ground and passed on to the Army authorities.

The pilot, who in A.C. squadrons is always an officer, is himself the observer. In the seat behind him is an air gunner, whose whole time is taken up in watching for attacks by enemy aircraft, thus leaving the pilot free from all anxieties on that score.

The air gunners are chosen from various R.A.F. trades, mostly armourers, signallers, photographers and aircraft-hands. On certain occasions it is necessary to carry an expert in the rear seat who must give attention to some technical matter, such as two-way W/T. When this is necessary, No. 16 (A.C.) Squadron usually sends two other machines to act as escort. It is undesirable that a machine should be without escort when the man in the back seat cannot give his full attention to protection.

A machine is also usually escorted when sent on what is called medium reconnaissance along the enemy's lines of communication. Perhaps if a special army co-operation aeroplane were produced which had a speed equal to that of any possible enemy fighters, and produced its best performance at heights between 4,000 and 6,000 feet, it might be justifiable to send single machines on medium reconnaissance, and this would certainly be an economy of effort.

Message picking up is practised seriously, not merely as a stunt for Hendon. Wireless may fail, and then the machines must fall back on this way of communicating with the military headquarters. Supply dropping, using special canisters, has been seriously undertaken on the



Indian Frontier and in Iraq, and may be required at any time in an emergency. Artillery reconnaissance is much the same operation as it was during the war. The squadron artillery officer keeps up liaison between the R.A.F. and the artillery. When artillery reconnaissance is in progress an airman signaller is posted by the battery to receive the messages from the air, which are sent by one-way W/T in code. There are three forms of signalling used, namely, two-way W/T, which has to be worked by an operator in the back seat, one-way W/T from air to ground, which is worked by the pilot, and two-way R/T, also worked by the pilot. It is obvious that the pilot is a pretty busy man, but it is reckoned that flying the machine comes to him so automatically that it does not use up any of his energy or distract his attention from more important matters.

In addition to its army co-operation duties the squadron is also trained to meet the normal requirements of air warfare. These include night flying, front and rear gun firing, and both precision bombing and dive bombing.



An Old Sarum group: Officers and flight sergeants of No. 16 (A.C.) Squadron. Reading from left to right (standing): F/Sgt. Payne, F/Sgt. Williams, F/Sgt. Copeland, P/O. P. H. R. Saunders, P/O. G. E. Jackson, F/O. J. F. L. Zoru, F/O. G. Morgan-Smith, F/O. J. N. McAuley, P/O. W. T. King, P/O. P. L. Doukin, F/O. F. S. Wakeham, P/O. N. D. Gilbert-Smith, F/Sgt. Gallie, F/Sgt. Frost. (Sitting): F/Lt. W. D. Butler, Lieut. R. O. V. Thompson, Capt. G. M. St. Leger, S/Ldr. R. P. Musgrave Whitham, O.B.E., M.C., F/Lt. G. H. Russell, D.F.C., F/Lt. T. Humble, F/Lt. T. P. P. F. Fagan. (*Flight Photograph.*)

# LEGAL ASPECTS

*Summaries of Two Further Papers Read at the S.B.A.C. Conference : Mr. C. V. Allen on Points of Law Affecting Airport and Transport Operators, and Mr. H. R. Gillman on National and International Aviation Control*

**T**WO other interesting papers read at the S.B.A.C. Conference (reported on pages 67-70) dealt with legal aspects of aviation. One, by Mr. C. V. Allen, Director and Legal Adviser of the S.B.A.C., discussed points of law affecting airport and air transport operators; in the other, Mr. H. R. Gillman, Secretary of the S.B.A.C., dwelt upon the existing laws and regulations of national and international control of civil aviation.

Mr. Allen, dealing briefly with certain points of law affecting airport operators, said that one of the first was the duty of the operator to ensure that his aerodrome was reasonably fit for the purpose for which it was to be used; if there was some defect on a landing ground, as a direct result of which a visiting aircraft was damaged, the owner of the aerodrome would then, in his opinion, be liable for the damage. (In the subsequent discussion it was pointed out that correct marking of a defective area would probably exonerate the airport operator from blame.) In the case of an accident happening through a mistake on the part of the control tower operator, the airport owner would be liable if the control tower operator was his servant.

It appears from the paper that the aerodrome owner is, generally speaking, liable for accidents which occur to visitors to the aerodrome getting in the way of aircraft, as it is held that it is his duty to take steps to avoid accidents of this kind.

Coming to the question of liability for damage to aircraft in hangars, the lecturer said that the same laws as those which apply to garage proprietors applied here also, and it was always open to the airport owner to stipulate that he houses aircraft only on certain conditions. These conditions could, for example, be printed on the back of a ticket which would be given when the machine was housed and would relieve the owner of any liability whatsoever. By means of a concrete example Mr. Allen pointed out the absolute necessity for ensuring that the attention of the aircraft owner was drawn to the provisions of the ticket.

## Repairers' Liabilities

In their capacity as repairers of aircraft, airport operators have in general law a lien on the article being repaired only for the labour done and the materials supplied, and this lien conferred no right of sale and did not cover housing accommodation. Instructions for repair should only be given by the owner of the aeroplane or someone who had the owner's express authority. The lecturer also quoted a case concerning the repair of motor cars which made it clear that when quoting for repairs the repairer should state specifically that any spare parts would be obtained from the maker, as then the repairer would not be liable for any subsequent breakdown.

Turning then to the question of damage caused by an aircraft to persons or property on the ground, the lecturer quoted the Air Navigation Act, which states: "When material damage or loss is caused by an aircraft in flight, taking-off or landing, or by any person in any such aircraft, or by any article falling from any such aircraft to any person or property on land or water, damages shall be recoverable from the owner of the aircraft in respect of any such damage or loss without proof of negligence or intention or other cause of action as though the same had been caused by the owner's wilful act, neglect or default."

On the subject of liability in respect of passengers and goods, the owner, according to the "Carriage by Air Act, 1932," if either directly, or through his servants is negligent and as a result a passenger is injured or killed, then the owner is liable to pay compensation. "Negligence" in this case, said the lecturer, probably meant doing something which a reasonable man would not do, or omitting to do something which a reasonable man would do; that would cover negligent piloting or the provision of an aircraft which was defective. It was, however, open to the transport company to make a contract with the passenger or the owner of the goods under which liability was excluded.

The discussion which followed the paper was mainly con-

fining to the answering by the lecturer of queries concerning legal matters put by those present, though, as Mr. Allen pointed out, his answers could only be his own opinion.

The majority of questions were on the subject of the liability of airport operators and of the pilots using airports, and in general it appeared that the pilot is liable in all cases where he causes damage to anybody or anything on the ground, in fact, it has been said that if the aeroplane turns over due to running into an unmarked soft patch on an aerodrome, and in doing so damages both the aerodrome and the aeroplane, the pilot may possibly be able to sue the aerodrome proprietor for the cost of the damage to the aeroplane, while the aerodrome proprietor can sue the pilot for damaging his landing-ground. It is obvious, therefore, that the law on this point requires clarifying considerably.

## Mr. Gillman's Paper

Mr. Gillman's paper was designed to be a useful document for the guidance of those not fully familiar with the various national and international regulations governing civil aviation.

Mr. Gillman divided civil aviation into sections: (a) Manufacturers of aircraft, aero engines, and aircraft materials; (b) operators and users of aircraft; (c) private owners; (d) pilots; (e) navigators; (f) ground engineers; (g) operators and owners of aerodromes. He did not, however, deal with the regulations controlling the manufacture of aircraft, or the qualifications for pilots, navigators and ground engineers. He showed that civil aviation was regulated by the Air Navigation Act, the Air Navigation (Consolidation) Order, and the Air Navigation Directions, the Act being Parliament's authority to a Government department to take action, the Order containing the requirements of the Government, and the Directions specifying how things should be done.

Internationally, the chief document was the International Convention for Air Navigation. This contained international requirements for Certificates of Airworthiness, Certificates of Competency, rules to be observed in air navigation, and the general provisions for international air transport. This Convention had been ratified by the majority of countries except Soviet Russia, the U.S.A., and Germany. Attached to the Convention were a number of Annexes dealing with such subjects as international call signs, rules as to lights and signals, ground markings, Customs facilities, and so on.

The lecturer said that there were no Air Ministry regulations affecting the formation of companies, but that the safety of passengers, goods and mails required that all aircraft should be in the possession of a current Certificate of Airworthiness. He then explained the responsibilities of ground engineers, who are responsible for certifying aircraft as airworthy. He also dealt in brief with the log books which must be carried.

Another Act of interest to air transport operators is the Carriage By Air Act of 1932. This deals with the rights and liabilities of carriers, consignors and consignees. Other Conventions mentioned, not yet ratified but which will eventually become law, were (1) relating to precautionary arrest of aircraft. (2) Damage caused by aircraft to third parties on the ground. (3) The salvage of aircraft. (4) Aerial collisions. Brief mention was also made of the Air Navigation (Investigation of Accidents) Regulations, 1930, which specified the steps to be taken when an accident occurred.

Dealing with the rules affecting the establishment of an aerodrome, Mr. Gillman referred to the parts of the Air Navigation Act concerned with this subject and also the Town and Country Planning Act, the Public Health Acts, and others affecting different localities, such as the City of London Sewers Acts. He then discussed the various steps which had to be taken in the establishment of an aerodrome, and with the Air Ministry Pamphlet No. 55, which contains all the requirements for licensing and classification of civil aerodromes.

In conclusion, he discussed a Handbook for the use of airport operators who are members of the Airports Division of the S.B.A.C., and pointed out that the Society had a great deal of experience in dealing with the Air Ministry, and that it could, therefore, very materially help all members of its Air Transport section.



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# PRIVATE FLYING

LORD SEMPILL, A.F.C., F.R.Ae.S.,  
MAKES AN ENFORCED STAY AT CALCUTTA ON HIS WORLD FLIGHT AND  
DISCUSSES AVIATION PROGRESS IN  
INDIA

AT Calcutta I was held up for two days by the discovery that my oil tank had developed a small leak in the lower seam where it backed on to the fuselage. As this showed signs of extending, I decided to remove the fairing and fabric and have it thoroughly repaired whilst I had the opportunity. Having dismantled the tank I was able to get it rewelded by the Aluminium Manufacturing Company, who did it well. I considered myself fortunate in thus getting over a difficulty which, unattended, might well have assumed serious proportions. I was much indebted to Mr. Woollard, who is in charge of technical matter for Indian National Airways, for all the assistance I received in this connection. The Indian ground engineer deputed to help me was a good mechanic, very willing and careful.

During my enforced stay at Calcutta, I was the guest of Mr. R. C. Kemp, a director of Indian Air Survey and Transport, Ltd., and Indian National Airways, who is a real pioneer. Both he and Mrs. Kemp were most kind, and I was very grateful for their hospitality, particularly as they were preparing shortly to leave for England. It is one of the pleasures of a trip of this kind that everywhere one finds old friends whose desire to make one feel comfortable and at home will not be denied.

The airport situated at Dum-Dum, well known, of course, as the place where the soft-nose expanding bullets of the same name were originally made, is some ten miles from Calcutta. The aerodrome is good in dry weather, and the buildings are well equipped and maintained, but serving as it does one of the largest cities in the world, it should be more central, and it is probable that a site only two miles away from Calcutta will take its place.

## Empire Air Routes

IN view of the criticism levelled at the comparative slowness of our air lines, it is worth pointing out that the air traveller from London will, in accordance with present time-tables, reach Calcutta in seven days whether he flies by British or Dutch machines. If he chooses a French air line, his journey will take a day longer. It was, until the recent assurances, the future acceleration of our Imperial air services which had caused anxiety. Both the K.L.M. and Air France seem to be well ahead with their plans for 1935, and if the former are able to place the Douglas machines into regular service, and the French utilise the new Dewoitine monoplanes on their eastern route, we must lose no time in equipping ourselves to meet this competition.

The speeding up programme visualised by our own Government involves, of course, a great improvement in ground organisation along the route, and it is much to the credit of the Indian authorities that they have realised the importance of this essential aspect. In August last the Indian Government voted an expenditure up to £700,000 for the main purpose of increasing such facilities.

The development of commercial aviation in India cannot, of course, be compared with that in Europe and America, but the foundations have been well laid, and there is every reason to hope that progress will be continuous. At a time when there seemed to be a suspension of official interest in

# Developments In India

aviation the Tata Company, as a private enterprise, stepped into the breach. Compared with its vast interests in other commercial fields, the venture of this company into air transport was but a small activity. Nevertheless, its highly successful pioneering service from Karachi to Madras via Bombay, a distance of 1,500 miles, showed what could be done under Indian conditions. Although passengers are carried over some section of the route, the policy of the company has been to concentrate on the carriage of mails and freight. Comparatively small machines have so far been used, but the increase in the demand for this service is such that the company will soon have to add to their flying stock. An extension of this line to Ceylon will, it is hoped, be in operation within the next few months.

A great deal of credit is due to the Tata Company, for not only have they shown their faith in the future of air transport in India by being the first in the field, but it is said they have maintained this service with 100 per cent. regularity. With the formation of India Trans-Continental Airways, Ltd., and Indian National Airways, Ltd., a great impetus has been given to commercial flying. The former company, which is, of course, controlled by Imperial Airways, Ltd. (I.N.A. and the Indian Government are also shareholders), is responsible for the Imperial route from Karachi to Singapore. Indian National Airways operate, in addition, a line between Calcutta and Rangoon via Chittagong, Akyab and Bassein, and also run between Calcutta and Dacca. Extensions are proposed.

## Government Assistance

THERE is no doubt the Government of India is impressed with the potentialities of aviation, and its financial support takes various forms. Last year they allotted Rs.40,000 from the Petrol Tax Fund for certain purposes in connection with flying. Part of this sum was used in providing financial assistance for a number of Indian ground engineers to undergo further training in England.

In view of the attention which has recently been focused on the question of prohibited areas, and the inconvenience which has been caused, particularly to private flying in some European countries, it is interesting to note that there is a tendency to revise these restrictions in certain districts on the N.W. frontier of India. Practically the entire N.W. boundary comes under this category, but, in order to allow civil aircraft to fly as far as Quetta and other districts in Baluchistan, areas previously prohibited have been opened up for this purpose.

The value of aircraft was well demonstrated during the great earthquake in Bihar last year. When this occurred it so happened that one of the machines belonging to India Air Pageants, Ltd., which organisation, incidentally, did a good deal to popularise flying in India, was at Patna. The pilot in charge immediately volunteered to fly over the area of destruction, as all rail, road and telegraphic communication with the three districts affected were destroyed. By this means photographs were taken and preliminary reports made available within a few hours, enabling the Bihar Government to assess the damage caused. Had it not been for the fact that aircraft were available, the isolation of the whole affected area would have continued for days and in some parts for weeks. During this terrible period many reconnaissance flights were carried out. His Excellency the Governor and other high officials were able to visit the towns which were cut off, confer with the local authorities on questions of relief and return to headquarters on the same day.

**Private Flying****FROM THE CLUBS***Events and Activity at the Clubs and Schools***KENT**

Flying time for the week ended January 12 was 7 hours. One new member joined, and Mr. Gordon is busy putting in hours for his "B" licence. The club is shortly taking delivery of another "Hawk."

**YORKSHIRE**

During the fortnight ended January 11 the Yorkshire Aeroplane Club flew 23 hr. 30 min.—an increase of two hours on the figures for the entire month of December, during which three new members joined. Mr. F. Wallace made a first solo. A second clubhouse dance will be held on February 2.

**CINQUE PORTS**

New members joining the club last week were Mr. A. S. Hell, as a private owner country member, and Mr. T. M. Goulding, to obtain his "A" licence. Flying time amounted to twelve hours.

On Friday night the club held their January dance at the Grand Hotel, Dover.

**BROOKLANDS**

Last week an "A" licence was obtained by Miss Malcolm and Major Benning renewed one. In spite of fog, flying times amounted to 35 hours solo and 20 hours dual. Visitors included Mr. Percival, who came down in his "Gull," Mr. Wilson in a Klemm "Eagle," and Mr. Topham, who flew from Northampton in his Bristol Fighter. He was to have flown on to Lympne, but was forced to cancel his journey owing to dense fog.

**READING**

Mlle. Smaranda Braiescu has joined the Phillips and Powis School of Flying. This lady hails from Rumania, where, it is believed, she holds a parachute record, having made a jump from 24,000ft. She has placed an order for a "Hawk Major" with tankage for 2,000 miles.

Mr. F. G. Miles and his staff are installed in their new two-storey drawing office, and Flt. Lt. "Tommy" Rose has taken over the vacated office. Many building operations are in progress on the aerodrome.

Reading Aero Club is ready to repel the Brooklands attempt to regain their spot landing prestige at 11 a.m. next Sunday.

**MIDLAND**

Poor visibility prevailed during last week, and most of the 19 hr. 45 min. were flown on Saturday and Sunday. On Tuesday of this week a lecture on navigation and map reading was given in the clubhouse, and on the 22nd there will be a whist drive.

**NORTHAMPTONSHIRE**

On Sunday, January 6, a members' dinner and dance was held in the clubhouse, and proved to be a great success.

Flying hours continue to increase, and a new flying member this week is Mr. H. Keunen. A visitor by air was Major Shaw, who brought his Avro "Commodore."

**HANWORTH**

Although there were three non-flying days at Hanworth last week, the flying time reached a total of 21 hr. 45 min. Five new members joined. Members are asked to note, incidentally, that the clubhouse will remain open during the alterations, which will be started within the next few days.

**CAMBRIDGE**

Flying times at the Cambridge Aero Club and Marshall's Flying School, Ltd., last week were 25 hours dual and 11 hours solo. Mr. F. W. Green and his son went off solo in their Klemm during the week. Mr. Green has three sons who are either pilots or about to become pilots. Another member took delivery from the school of a very smart Gipsy I "Moth" on Saturday.

The Civil Aviation Service Corps attended with nine members on Sunday, and put in more than six hours' flying.

**HARROGATE**

The Standard Training glider built by the constructional section of the Aircraft Club, Harrogate, has now been in use for six months, and between six and seven hundred flights have been made with it. Next week it is to be withdrawn from service for inspection, but will be flying again on January 26. During the coming week-end the "Zephyr" will be used.

Steady progress is being made with the construction of the second S.T. glider, and this should be ready in the spring.

The membership figure has now passed the fifty mark.

**HERE AND THERE***The Shell "Rapide"*

The Shell Company's new D.H. 89 ("Rapide"), which is to be delivered this week for use in Australia, will be used for inspection of the ground organisation. The machine is equipped with special thermometers for testing oil temperatures while in the air.

*The Gliding Subsidy*

On February 1 the reconstituted British Gliding Association will ratify at its general meeting their scheme for the allocation of the grant announced last June. The Air Ministry required that the B.G.A. must be controlled by the clubs themselves, which must each have a minimum of twenty-five flying members.

*Canadian Airways*

During the first eleven months of last year Canadian Airways, Ltd., flew 1,493,875 miles, carrying 5,829,060 lb. of freight and mails and 13,554 passengers. These figures are higher than any since the mail contract was lost in 1931.

Meanwhile, rapid progress is being made on the Trans-continental airway, 3,108 miles long, between Halifax and Vancouver; 114 landing fields are being laid out.

*The Airspeed-Fokker Combination*

News has leaked out, somewhat prematurely, about the negotiations which are taking place between Airspeed (1934) Ltd. and Mr. A. H. G. Fokker. Although no final decision has yet been made, it is expected that agreement will be reached, and that the British firm will acquire the rights to construct in Great Britain certain aircraft of Fokker design, and types for which he holds the European licence, including presumably the Douglas D.C.2. A new issue of 5s. shares in Airspeed (1934) Ltd. at 6s. per share is foreshadowed, but the company will remain unaltered except that Mr. Fokker would act as consultant.

*Croydon's Traffic*

According to official figures more than 100,000 passengers passed through Croydon Airport during 1934! Of these, more than half were carried by British lines.

*Mail Increase*

Some interesting mail figures have been received from Karachi, showing that the eastbound Christmas mail had increased by 77 per cent. on last year, while the total mail despatched from Karachi increased by no less than 378 per cent. On the westbound service the incoming and outgoing mail showed increases of 74 and 63 per cent. respectively.

*Finding a Club*

In the monumental list of English clubs in all parts of the world to be found in "Clubs—1935," by E. C. Austen-Leigh, M.A., details of most of the flying clubs are given. Among the many interesting facts, two are rather outstanding: There are no fewer than 3,950 ordinary clubs, and apart, of course, from the Royal Aero, the Midland Aero is the oldest flying club in the country.

*Sheffield Returns to the Dark Ages*

The supporters of aviation in Sheffield have received a severe blow. In a letter to the Sheffield Chamber of Commerce, on December 18, the Town Clerk stated that on and after March 1 no aeroplanes will be allowed to land at Coal Aston, Sheffield.

The reason given for this ban is that elaborate preparations are necessary for the Yorkshire Show to be held there in July, but it is rumoured that the ban will remain, and that the site will be used by the Corporation for housing. This retrograde step has caused much dissatisfaction, for Coal Aston has been described by Sir Alan Cobham as "The only possible site within reasonable distance of the city." Meanwhile, Rotherham, "Sheffield's little sister," is interested in a site near Thurgroft.



FOREIGN AIRCRAFT**A CONTINENTAL FEEDER-LINE TYPE***The "Gipsy"-engined Koolhoven F.K.48 Monoplane*

The "Gipsy" engines give the Dutch Koolhoven F.K.48 a top speed of 130 m.p.h.

THE Koolhoven F.K.48 "Ajax" taken over by K.L.M. for their internal schedule should be interesting to readers of *Flight*, as England has given considerable attention to the feeder-line type of aeroplane carrying half a dozen passengers on 200-300 h.p.

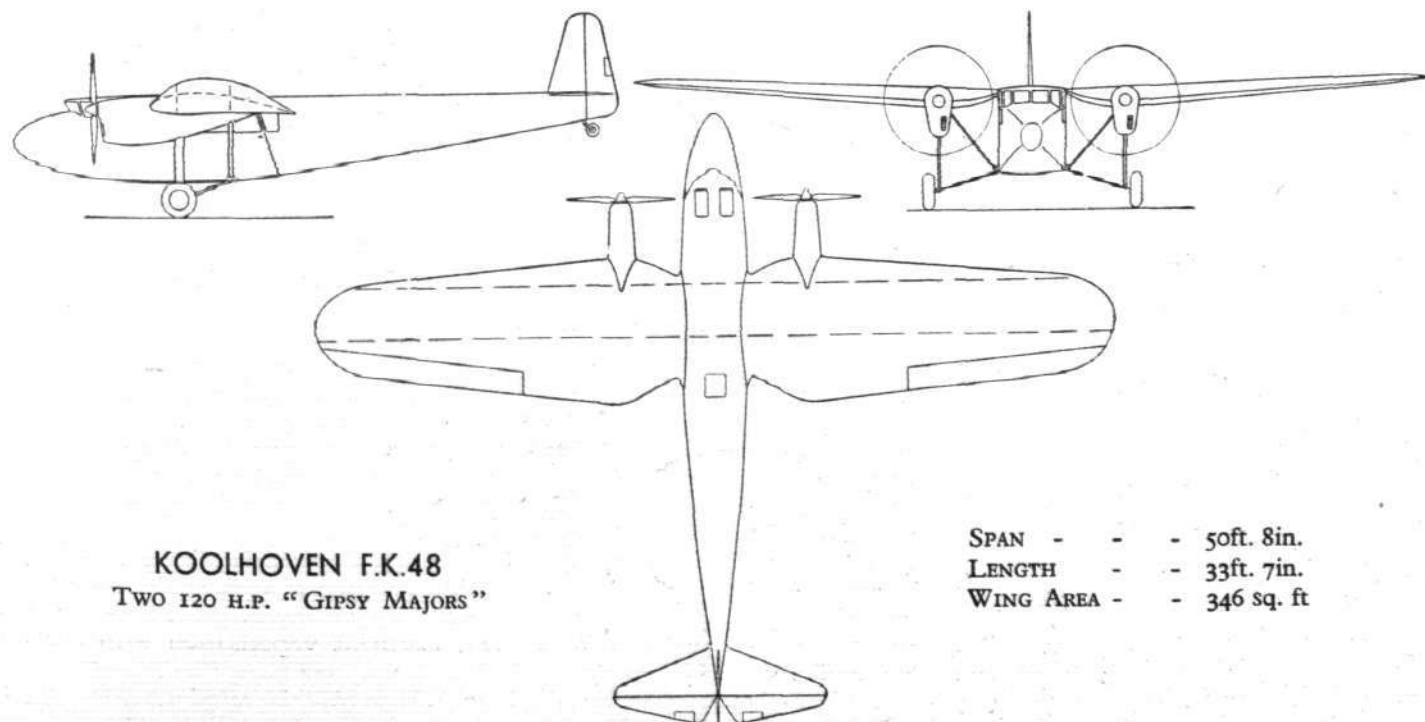
The Dutch machine in question is designed to provide room for rather more passengers than the average small single-engined aeroplane, and at a higher cruising speed than was previously considered sufficient.

The wing is built up with box spars and plywood ribs, with a ply covering taking all internal and torsional loads in the normal manner. The wings are for the greater part cantilever, but struts run from the bottom of the fuselage to the engines, thus relieving both flying and landing loads. Advantage has been taken of this fact by reducing the wing depth and chord at the root to eliminate interference; at the same time, the result is very pleasing to the eye. The top of the wing remaining straight and the lower surface sloping up to the fuselage, it has been possible to obtain a much lower engine

position than would have been the case had the wing been fully cantilever and placed on top of the fuselage. Moreover, tests with wool-tufts doped on to the trailing edge showed that the whole wing stalled at the same moment.

The fuselage is a welded steel tube structure throughout, covered with fabric in the usual way. The section at the nose is elliptical, gradually shaping out to a rectangle at the front of the cabin. The pilots' compartment seats two, with duplicate controls and a very complete set of instruments. The windscreen is of the forward-sloping type, while an ingenious arrangement of slots prevents the air from breaking away over the top of the fuselage when the machine is pulled up at an angle near the stall.

Normally the cabin seats six passengers. For joy-rides the number of passengers would number nine with one pilot, while as a private owner's or private charter machine the machine would be furnished with four or five very comfortable chairs and a lavatory aft. All cabin equipment can be easily taken out and freight carried.



**KOOLHOVEN F.K.48**  
Two 120 H.P. "GIPSY MAJORS"

SPAN - - - 50ft. 8in.  
LENGTH - - - 33ft. 7in.  
WING AREA - - - 346 sq. ft

The tail unit is built up on a welded steel tube frame and sheet steel ribs, the whole fabric-covered. Trimming tabs are provided on elevators and rudder, this being considered a far simpler way to obtain correct trim than by the use of costly tail-trimming gear.

The undercarriage has a very wide track, the oleo legs being attached to the front spar with axle and radius rod running to the bottom of the fuselage. A sprung tail-wheel, free to rotate through a complete circle, simplifies handling on the ground. Brakes and tyres are by Dunlop.

The two "Gipsy Majors" are suspended in rubber blocks on a welded steel structure running from the front spar. One petrol tank is provided for each engine, and two pumps draw the fuel to the carburettors.

As supplied to K.L.M. the F.K.48 is fitted with wireless, night-flying equipment and electric starting gear.

Data are given in the adjacent column.

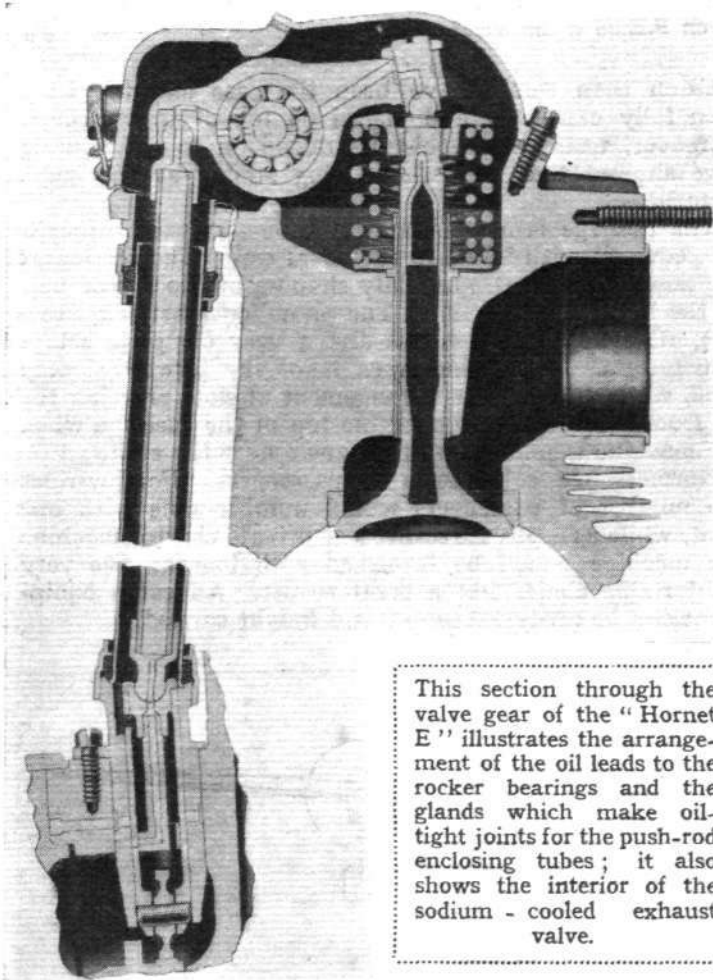
#### KOOLHOVEN F.K.48.

TWO 120 H.P. "GIPSY MAJORS."

FEEDER-LINE OR PRIVATE CHARTER HIGH-WING CABIN MONOPLANE.

DIMENSIONS.			
Span	...	...	50ft. 8in. (15.20 m)
Length	...	...	33ft. 7in. (11.00 m)
Height	...	...	8ft. 10in. (2.65 m)
Wing area	...	...	346 sq. ft. (31.15 m <sup>2</sup> )
WEIGHTS.			
Weight empty	...	...	2,580 lb. (1 150 kg)
Disposable load	...	...	2,020 lb. (1 000 kg)
Total weight	...	...	4,600 lb. (2 150 kg)
PERFORMANCE.			
Maximum speed	...	...	130 m.p.h. (208 km/h)
Cruising speed	...	...	118 m.p.h. (187 km/h)
Landing speed	...	...	58 m.p.h. (95 km/h)
Initial rate of climb	...	...	600 ft. p. min. (3 m/sec)
Theoretical ceiling	...	...	14,000ft. (4 200 m)
Service ceiling	...	...	11,300ft. (3 400 m)

## A STILL MORE POWERFUL "HORNET"



This section through the valve gear of the "Hornet E" illustrates the arrangement of the oil leads to the rocker bearings and the glands which make oil-tight joints for the push-rod enclosing tubes; it also shows the interior of the sodium-cooled exhaust valve.

*The Pratt and Whitney "Hornet E"  
Geared and Supercharged Engine :  
750 h.p. at 7,000 ft. : Positive Valve  
Gear Lubrication and Automatic Oil  
Temperature Control*

push-rods into the rocker arms and is distributed to the various parts in the rocker box requiring lubrication. After serving its purpose the oil passes via the push-rod covers to the crank case or by way of a newly designed scavenging ring to a sump, whence it is pumped back into the oil tank.

A thermostatic oil-temperature regulator is included as standard equipment. This feature is claimed to reduce the warming-up period to about one half. Priming equipment is an integral part of the engine and is built into the carburetter and manipulated by the throttle and mixture controls in the cockpit.

Possibly the most notable feature of the new engine is the improved design and choice of materials of the cylinders and parts forming the combustion chambers. The new cylinders are stronger throughout, and by means of deep and closely spaced fins in combination with close-fitting baffles, satisfactory cooling with weak mixtures is obtained. Improved alloy steel is used for the barrel, which is ground with a converging taper at the top to allow for expansion and provide a straight-sided bore at normal running temperatures. Instead of bronze, austenitic steel valve seat inserts are shrunk into the cylinder heads.

#### Valve Design

The exhaust valves are faced with stellite and are sodium cooled. Instead of being cylindrical, the sodium chambers are "necked down" to provide greater strength at the section where failure is most likely to occur.

A new cam and cam-drive mechanism, in which the cam is mounted on and rotates about an annular pedestal or shoulder on the front face of the crank case, is incorporated. A two-piece crankshaft split in the centre of the pin is another feature. The reduction gearing has been considerably simplified.

A new type "hot spot" is another interesting detail. Exhaust gases travelling along a streamlined tube which passes through the centre of the mixture passage, produce, it is claimed, excellent vaporisation with low loss of power.

The SiE-G type "Hornet" is rated at 750 h.p. at 7,000 ft., is geared 3:2, has a compression ratio of 6.5:1, and a supercharger gear ratio of 12:1. The engine is 54½ inches in diameter, 51 inches long, and weighs 1,005 lb.

**C**LAIMED by its manufacturers to be the highest-rated commercial engine of its type in existence, the Pratt and Whitney "Hornet SiE-G," recently granted its approved-type Certificate by the U.S. Department of Commerce, is a single-row nine-cylinder radial developed from the "Hornets" which have given such excellent service in military and civil types throughout the world. Several new features tending further to improve performance and durability are incorporated.

Like the new "H"-type "Wasps" recently put on the market, the "Hornet E" is equipped with automatic valve gear lubrication, which is said to improve starting, reduce wear of the valve gear, simplify servicing, and reduce maintenance costs. Engine oil under pressure is fed to a distributing groove machined in the nose section of the engine and through ports to the valve tappet mechanism. Thence it flows through the interior of the



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### LATERAL BIAS GEAR

[2995] In your description of the "Lynx"-engined "Envoy" you state that an aileron bias gear is fitted, and remark that it will "allow for the idiosyncrasies of pilots, the majority of whom fly with one wing slightly lower than the other." If it is agreed that the majority do so forget their early training, surely the tendency is caused by an unconscious steady pressure rather than by a poor sense of the horizontal. In either case the pilot would still fly one wing down, bias gear or no bias gear. Logic so insists.

G. N.

St. Albans.

### SPEED—AND SAFETY

[2996] There are serious limitations to the use of certain of even the most modern instruments available for the navigation of aircraft. For example, we have not yet got an altimeter which will give us the height of a plane above ground. An adaptation of the marine echo-sounding apparatus will probably prove suitable, but in the meantime some of our best pilots on route survey flights have crashed into the sides of mountains while flying blind at an altimeter level of, perhaps, 10,000ft. We cannot afford to lose these men.

Again, there is the question of drift. It is comparatively easy to estimate drift when flying over land or sea in clear weather, but what of flying blind in fog or cloud, or above the clouds? In a recent sea crossing of 1,200 miles two airmen made the passage from coast to coast in 9½ hours, but they were 600 miles south of their destination. It is reasonable to assume that a fair percentage of this error was due to drift. Fortunately a long landfall prevented serious consequences. A drift recorder has been worked out in principle and is now in the experimental stage. It is positive in action, and does not require any ground sight or communication.

Probably there are many other instruments being designed at present, but progress is too slow. The development of air routes is proceeding, and a great deal of money will be spent in radio beaconing these routes. Then it is quite conceivable that some new instrument will be produced which may render

the beacons obsolete or unnecessary. The point therefore arises: How can we accelerate the design of aircraft instruments? The one answer seems to be to offer a substantial prize for the instrument of most value to aviation. The Melbourne Air Race focused attention on speed, with startling results. Unfortunately, the donors of prizes, being human, like a run for their money, and thus undue preference has been given to the more spectacular competitions for speed and for flight.

One of the big operating companies might find it a good investment to offer a prize for navigational instruments. It would fix the attention of designers more intensely on instruments, and one cannot say what revolutionary instrument may be produced.

The need for more accurate instruments—for some purposes—is definitely more urgent than the need for greater speed at the present time.

Wembley, Middlesex.

ROBOT.

### "NUTS TO CRACK"

[2997] The latest of Flt. Lt. Comper's problems is certainly a teaser. The behaviour of the airscrew was remarkable in itself, but the sudden stripping of the fuselage was even more so. Putting two and two together to make one, I should be inclined to say that the R.E.8 had unwisely wandered into the orbit of a shell (as, I believe, more than one less lucky pilot did during the War). Apparently the shell smashed the prop., and then planed off the fuselage covering, though without damaging the tail unit.

NUTCRACKER.

London, W.1.

["Nutcracker" has almost arrived at the correct solution, though actually it was not the shell itself which stripped the fuselage. Flt. Lt. Comper gives the true answer as follows: "The aeroplane had flown into the flight-path of a dead shell which had neatly cut a semicircular piece of wood out of the trailing edge of one of the four airscrew blades. Hence the vibration. The shell travelled from nose to tail, missing everything, but the rush of air caused by its passage had denuded the fuselage side of its fabric covering."—Ed.]

## THE COMPLETE AIRPORT

(Continued from page 70)

vided the best example, and he calculated that 213,655 people visited Croydon in 1933.

Apart from aircraft operation the activities of airport tenants were likely to be connected with the garaging and servicing of aircraft and with their hire or sale. Such tenants would be anxious that their sites were close to the centre of activities and in view of all possible customers.

The airport superintendent required his own office accommodation, well protected from the casual person, yet with a good view over the field and quick communication with the Control. In view of his responsibility for care and maintenance, the proper layout and construction of such items as the central switch-room, the cable ducts and manholes, vehicle shed, etc., was of great importance.

The functions of the control officer had emerged from those of point duty to those of signalman in charge of a number of long sections of air route radiating from his terminal. At present his "diagram" consisted of a map with flags, but, no doubt, an automatic indicator would be made in time. He must have every assistance that comfort and careful organisation can provide. His control room must be spacious, well warmed and ventilated, and with an unobstructed view of the whole horizon. The radio operating room must be immediately adjacent to it, but separated by a glazed partition to isolate noise.

The control officer would be particularly interested in the arrangements made for control of the airport lighting gear. The switching on of obstruction lights, boundary lights and wind indicator at the approximate hour was his job, and he might be called upon at short notice to give light for landing. All controls should be at his hand. The

point duty work was usually delegated to a man with Aldis lamp, but he must be able to speak instantly to this man and to take his place when necessary.

The exact minimum dimensions of the Customs office are usually stated by that department, but it must be remembered the officer spends long hours there. He will require a layout by which passengers and luggage from foreign countries are completely segregated as they pass to the examination counter.

The Meteorological Office must be adjacent to the control. Normally it should comprise at least two rooms, and the meteorologist would appreciate an easy way on to a section of roof convenient for making observations. Access to his forecasting room should be easy for pilots.

The radio operator had several needs of his own in addition to those mentioned in connection with control. Nearby he would want a room for stores and a location for apparatus. He would need a rest room and access to or communication with the meteorological office.

In conclusion, Mr. Norman explained, it is clear that in few instances would the requirements initially need to be so elaborate, but such a list might be used as a basis for working out possible needs in the future. As an example, the functions of Airport Superintendent, Air Control Officer and club secretary might be combined, and one hangar might accommodate all aircraft. In the allocation of sites and so on future requirements should be remembered. The layout plan could not possibly fulfil the needs of years to come, but the aircraft operator of to-morrow would not forgive the airport proprietor who failed in the study of essential factors.

# THE ROYAL AIR FORCE

SERVICE NOTES AND NEWS



AIR MINISTRY ANNOUNCEMENTS

## NO. 820 (T.S.R.) SQUADRON

No. 820 Squadron of the Fleet Air Arm is the first squadron which will receive the Blackburn torpedo-spotter-reconnaissance machine "Shark." The Squadron, which is in H.M.S. *Courageous*, has hitherto had the "Seal."

## WEST AFRICAN FLIGHT OF NO. 8 (BOMBER) SQUADRON

A revised programme has been approved for the flight of the four Fairey III.F aircraft of No. 8 (Bomber) Squadron from Aden to West Africa, consequent on the outbreak of yellow fever in Nigeria and Gambia. The flight will terminate at Freetown on January 22, the aircraft remaining there until January 27.

## THE ROYAL AIR FORCE BENEVOLENT FUND

The usual meeting of the Grants Committee of the above Fund was held at Iddesleigh House on Tuesday, January 8. Mr. W. S. Field was in the chair, and the other member of the Committee present was Mrs. L. M. K. Pratt Barlow, O.B.E. The Committee considered a number of cases and made grants to the amount of £415 14s. 6d. The next meeting was fixed for January 24.

## PERMANENT COMMISSIONS FOR S.S. OFFICERS

The undermentioned medical officers have been selected for permanent commissions, subject to physical fitness:—

*Flight Lieutenants.*—Thomas Drostan Lawson Bolan, L.R.C.P. & S., James Stewart Carslaw, M.B., Ch.B., Jack Anthony Kersley, M.R.C.S., L.R.C.P., Thomas Conchar Macdonald, M.B., Ch.B., Frank Herbert Peterson, M.D., M.C.P. & S., and John Lovitt Walsh, M.B., B.S.

## ROYAL AIR FORCE GAZETTE

London Gazette, January 4, 1935

### General Duties Branch

F/O. J. B. Knapp is promoted to the rank of Flight Lieutenant (Dec. 6, 1934).

The following Flying Officers are transferred to the Reserve (Dec. 27, 1934):—CLASS A.—W. B. Bailey, J. Bamber, C. W. W. S. Conway, L. E. Dalrymple, E. Elgey, C. J. Farrell, E. M. Gurney, G. J. Holland, L. W. V. Jennens, A. W. R. Lawson, R. P. J. Leborgne, D. W. Lucke, R. J. R. H. Makgill, W. C. Pitts, W. T. Ratcliffe, B. P. Reynolds, L. E. B. Stonhill, W. B. Thompson, A. R. Wilson. CLASS C.—G. R. White.

### Accountant Branch

F/O. N. Wallett is promoted to the rank of Flight Lieutenant (Dec. 3, 1934).

## ROYAL AIR FORCE RESERVE

### Reserve of Air Force Officers

#### General Duties Branch

The following Flying Officers are promoted to the rank of Flight Lieutenant (Jan. 1):—L. S. Ash, W. A. E. Featherstone, A. P. Miller, G. R. Jackson, J. Beaumont, F. P. Donovan, M.B.E., R. F. A. W. Williams, J. B. W. Pugh, A.F.C., J. H. Lock, H. P. Wilson, G. C. Butler, G. E. F. Procter, J. A. Harris, L. H. Snelling, H. J. A. Williams, P. Le M. C. Deacon.

The following Pilot Officers are promoted to the rank of Flying Officer:—C. F. Almond (Nov. 1, 1934); A. L. Maidens (Nov. 3, 1934).

F/O. L. C. Phillips relinquishes his commission on completion of service (Nov. 28, 1934); F/O. R. E. Collins relinquishes his commission on account of ill-health (Jan. 2).

### Stores Branch

Flt. Lt. C. E. Norris, O.B.E., is promoted to the rank of Squadron Leader (Jan. 1).

The following Flying Officers are promoted to the rank of Flight Lieutenant (Jan. 1):—L. R. Peirce, H. A. Smith, A. Amy.

## AUXILIARY AIR FORCE

### Stores Branch

No. 600 (CITY OF LONDON) (FIGHTER) SQUADRON.—G. J. Maygothling (Flight Lieutenant, R.A.F., Retd.), is granted a commission as Flight Lieutenant whilst serving as a Civilian Stores Officer with the Auxiliary Air Force (Nov. 19, 1934).

## TERRITORIAL ARMY

### ROYAL ENGINEERS

#### Anti-Aircraft Searchlight Companies

KENT & MIDDLESEX GROUP.—P/O. Barnett (late Cadet Lce.-Cpl., Sutton Valence Sch. Contgt., Jun. Div., O.T.C.) to be 2nd Lt., Jan. 2.

London Gazette, January 8, 1935

### General Duties Branch

F/O. R. A. McMurtrie is granted a permanent commission in this rank (Dec. 27, 1934).

The following Flying Officers are promoted to the rank of Flight Lieutenant:—H. E. Dicken, E. Coleman, D.F.M. (Dec. 17, 1934); B. Paddon (Dec. 28, 1934).

Sqd. Ldr. P. M. McSwiny is placed on the half-pay list, scale A, from Dec. 18, 1934, to Jan. 1 inclusive; the short service commission of Acting Pilot Officer on probation J. Addison is terminated on cessation of duty (Jan. 1); Acting Pilot Officer on probation J. Storey resigns his short service commission (Dec. 18, 1934).

### Stores Branch

Sqd. Ldr. W. J. King, D.C.M., is placed on the half-pay list, scale A, from Dec. 7 to 27, 1934, inclusive; Sqd. Ldr. P. J. Murphy is placed on the retired list at his own request (Jan. 1); Flt. Lt. G. C. Wilson is placed on the retired list (Jan. 5).

### Accountant Branch

F/O. J. R. Ackers is promoted to the rank of Flight Lieutenant (Dec. 3, 1934).

### Medical Branch

Flt. Lt. L. I. Hyder, M.R.C.S., L.R.C.P., is promoted to the rank of Squadron Leader (Jan. 6).

### Memorandum

The permission granted to Major A. C. Hagon to retain his rank is withdrawn on his conviction by the civil power (Oct. 24, 1934).

## PRINCESS MARY'S ROYAL AIR FORCE NURSING SERVICE

The following are appointed to the permanent service (Jan. 1):—SISTER.—Miss G. Toole. STAFF NURSES.—Miss V. M. Forcer-Williams, Miss I. F. Clark, Miss M. N. Creasy.

## ROYAL AIR FORCE RESERVE

### Reserve of Air Force Officers

#### General Duties Branch

F/O. W. McF. Russell is transferred from class AA (ii) to class C (Dec. 15, 1934); Flt. Lt. W. C. Venmore is transferred from class C to class A (Sept. 7, 1934). (Substituted for the notification in the Gazette of December 18, 1934).

### Medical Branch

Flt. Lt. V. V. Brown, L.R.C.P. and S., relinquishes his commission on completion of service (Dec. 21, 1934).



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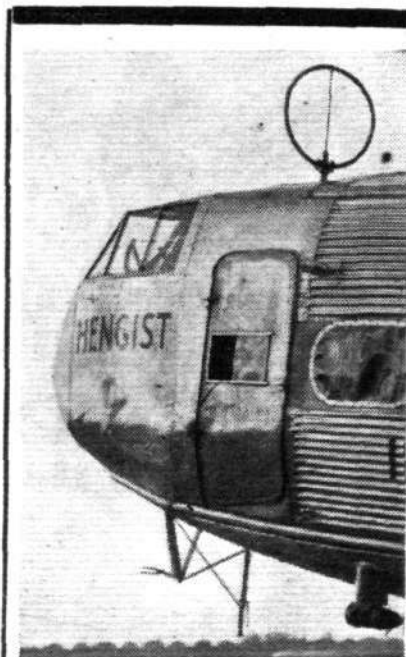
A new "homing" device has just been developed by Marconi engineers. This equipment not only indicates when an aircraft is off course but also incorporates a simple means of determining the number of degrees of error.

For this purpose a special rotating loop aerial with wheel control and a calibrated scale is connected to the well-known Type A.D.52 "homing" receiver.

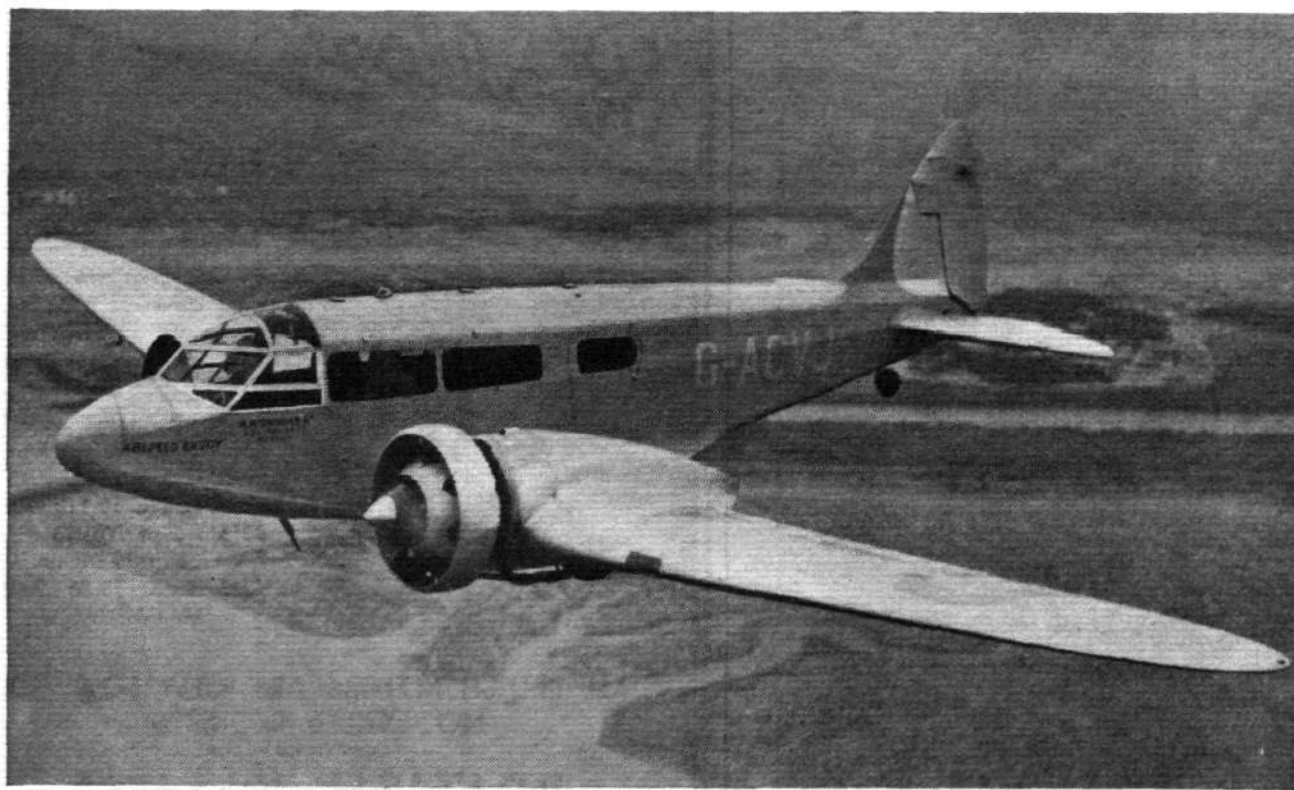
The new "homing" device can also be used as a simple form of direction finder for check bearings.

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*Special Reserve  
General Duties Branch*

B. J. R. Roberts is granted a commission as Pilot Officer on probation (Nov. 25, 1934); Pilot Officer on probation A. P. Anderson is confirmed in rank (Dec. 10, 1934).

**AUXILIARY AIR FORCE**

*General Duties Branch*

No. 604 (COUNTY OF MIDDLESEX) (FIGHTER) SQUADRON.—The fol-

**ROYAL AIR FORCE INTELLIGENCE**

**Appointments.**—The following appointments in the Royal Air Force are notified:—

*General Duties Branch*

**Squadron Leaders.**—R. V. Goddard, to Headquarters, Western Area, Andover, 1.1.35; for Air Staff duties vice Wing. Com. J. J. Breen. J. J. Williamson, A.F.C., to Headquarters, R.A.F., Iraq, 11.12.34; for Personnel Staff duties vice Sqd. Ldr. A. G. Bond, A.F.C. H. J. Saker, to Headquarters, A.D.G.B., Uxbridge, 2.1.35; for Signals duties vice Sqd. Ldr. E. F. Turner.

**Flight Lieutenants.**—L. R. Stokes, to No. 1 (Indian) Group Headquarters, Peshawar, India, 2.12.34. C. Snow, to R.A.F. Base, Calshot, 1.1.35. H. H. Brookes, to Station Headquarters, Upavon, 4.1.35. A. W. Franklyn, M.C., to H.M.S. *Furious*, 2.1.35. E. A. Hodgson, to No 216 (B.T.) Squadron, Heliopolis, Egypt, 17.12.34.

**Flying Officers.**—J. N. Baxter, to No. 2 Armament Training Camp, North Coates Fitties, 16.12.34. P. F. Foss, to School of Naval Co-operation, Lee-on-the-Solent, 1.1.35.

**Pilot Officer.**—J. R. Gillman, to No. 31 (Army Co-operation) Squadron, Quetta, India, 18.12.34.

**Acting Pilot Officer.**—C. R. Hart, to No. 3 Flying Training School, Grantham, 1.1.35.

*Stores Branch*

**Flight Lieutenants.**—A. E. Evans, D.F.C., to No. 2 (Indian Wing) Station, Risalpur, India, 2.12.34. A. J. Redman, D.F.C., to Aircraft Depot, India, Karachi, 1.12.34. W. C. Farley, to Aircraft Depot, India, Karachi, 11.12.34. P. J. Mote, to R.A.F. Base, Calshot, 3.1.35.

lowing are granted commissions as Pilot Officers:—M. T. Harraway (Nov. 27, 1934); A. R. Fane de Salis (Dec. 19, 1934).

No. 607 (COUNTY OF DURHAM) (BOMBER) SQUADRON.—P/O. L. E. Smith is promoted to the rank of Flying Officer (Jan. 3).

**TERRITORIAL ARMY**

*ROYAL ENGINEERS.*

*Anti-Aircraft Searchlight Companies*

KENT AND MIDDLESEX GROUP.—Lt. G. W. Wills to be Captain with seny. March 16, 1933 (Jan. 9).

**Flying Officer.**—R. C. Storrar, to No. 28 (Army Co-operation) Squadron, Ambala, India, 12.12.34.

**Pilot Officers.**—The following Pilot Officers are Posted to School of Store Accounting and Storekeeping, Cranwell, on 4.1.35. On appointment to Permanent Commissions:—A. L. Britton, L. C. Dennis, H. M. C. Harwood, H. Stones, and S. G. Walker. P. C. Pullen, to Station Headquarters, Abingdon, 3.1.35.

*Accountant Branch*

**Squadron Leader.**—O. K. Griffin, to No. 3 Flying Training School, Grantham, 4.1.35; for Accountant duties vice Sqd. Ldr. W. E. Fisher, M.C.

**Flight Lieutenants.**—A. L. Derry, to Station Headquarters, Biggin Hill, 4.1.35. F. C. Chalmers, to No. 208 (Army Co-operation) Squadron, Heliopolis, Egypt, 18.12.34.

*Medical Branch*

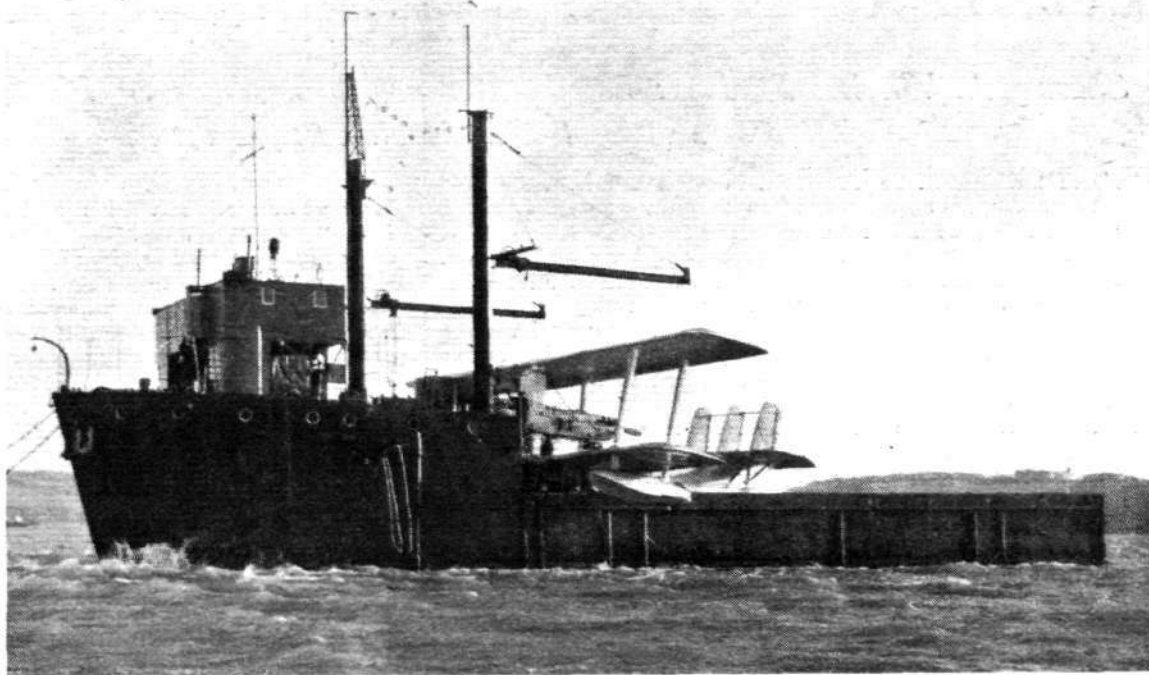
**Wing Commanders.**—J. Rothwell, to R.A.F. General Hospital, Palestine and Transjordan, 28.12.34; for duty as Commanding Officer. H. S. C. Starkey, O.B.E., to Headquarters, R.A.F. Mediterranean, Malta, 26.12.34; for duty as Principal Medical Officer vice Wing Com. D'A. Power, M.C.

**Squadron Leader.**—D. G. Boddie, to No. 4 Flying Training School, Abu Sueir, Egypt, 30.11.34; for duty as Medical Officer.

**Flight Lieutenants.**—H. C. S. Pimblett, to Princess Mary's R.A.F. Hospital, Halton, 29.12.34. J. H. Cullinan, to R.A.F. Hospital, Cranwell, 2.1.35.

**Flying Officer (Medical Quartermaster).**—J. Holt, to R.A.F. Hospital, Cranwell, 10.1.35.

**UNIQUE:** The floating seaplane dock at Pembroke is unique in being the only one of the type in the world. It can be sunk to take any vessel, seaplane or flying boat up to a draught of seven feet. Four adjustable jacks are provided, also workshops capable of undertaking extensive repairs. It will accommodate two flying boats at one time. On the dock is one of the four short "Singapore" which, as reported on pages 62-64, left for the Far East on Tuesday. Commanded by Flt. Lt. H. A. Castaldini (Retd.), who was in charge of all the water transport during the last Schneider contest, the dock is a model of efficiency and tidiness. (*Flight* Photograph.)



**Diary of Forthcoming Events**

Club Secretaries and others are invited to send particulars of important fixtures for inclusion in this list.

- Jan. 22. "Record Breaking Flights." Debate by Mr. and Mrs. J. A. Mollison, before the Women's Engineering Society 20, Regent Street, London.
- Jan. 29. Newcastle-on-Tyne Aero Club Annual Dinner and Dance, Barras Bridge Assembly Rooms, Newcastle-on-Tyne.
- Feb. 4. Jubilee Celebration of the Foundation of the City and Guilds College, Imperial College of Science and Technology.
- Feb. 8. "Ice Formation in Carburettors." R.Ae.S. Lecture by Mr. L. P. Coombes.
- Feb. 15. Annual Aviation Ball, Bristol and Wessex Aeroplane Club, Grand Spar Hotel, Clifton.

- Mar. 1. Annual Dance. Leicestershire Aero Club, Palais de Danse, Leicester.
- Mar 1. "Fuels for Aircraft Engines." R.Ae.S. Lecture by Mr. E. L. Bass.
- Mar 5. "Problems of Cold Presswork." Joint R.Ae.S. and Inst. A.E. Lecture by Dr. H. Gough and Dr. Desch.
- Mar. 15. "New Developments of the Autogiro." R.Ae.S. Lecture by Senor Juan de la Cierva.
- Mar. 29. "Piloting Commercial Aircraft." R.Ae.S. Lecture by Sqd. Ldr. H. G. Brackley.
- Apr. 12. "Commercial Aircraft." R.Ae.S. Lecture by Capt. G. de Havilland.
- May (Date not yet fixed). Wilbur Wright Lecture, R.Ae.S., by Mr. W. D. Douglas.

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### CROYDON

#### *Sharing the Wireless Burden : Some Interesting Personalities : "It's Safer Up Above" : A Brock's Benefit Narrowly Averted*

CONSIDERABLE improvement in wireless facilities should be shown next summer, when Pulham and Lympe are both fitted with 862-metre telephony sets. Much delay, now unavoidable owing to the overworking of Croydon, should be obviated, though there are rumours of an almost alarming increase of services for next season.

This traffic control business is not so simple as casual visitors to the Croydon control tower, writing naïvely in the Sunday newspapers, would have us believe. What seems to impress them most is the little coloured flags on a large map which are moved from time to time, and which, they suppose, "show the exact position of the machines." Actually they only give the officer a rough idea of the position of the machines, and represent the least, not the most important, part of traffic control. They are bright, colourful little flags, however, and always catch the amateur eye at once.

Capt. Percy, of Imperial Airways, well known for the entirely all-British bulldog which usually accompanies him, sniffing scornfully at foreign air traffic, took his ticket last week as a commander on "Heracles" types. Previously he was an "Argosy" captain. He joined Imperial Airways some years ago when he went through the shops before becoming first officer on the air routes.

I hear Capt. Jimmy Youell is jogging along comfortably

towards Australia with the D.H.86 for delivery to Qantas. His first officer is Mr. Allen, and Mr. Cash is wireless operator. Mr. "Tug" Wilson, one of the oldest and best known engineers at Croydon, is also aboard as flight engineer.

The first of the duplicated African services arrived at the Airport on Sunday, an unusual day for an Empire service to arrive, but a good one, for there are always large numbers of spectators on this day.

Capt. O. P. ("Kettle") Jones was hurrying to the airport in his car last Sunday when a collision occurred. He got a lift, and took off exactly on time, at 12.30 p.m., and had a look at his damaged car as he flew over it towards Paris. It is safer in the air. . . . A little later a Miss Graham was unlucky enough to hit the roof of the pyrotechnic store when taking off in a small machine. Luckily the fireworks did not go off.

Lady Chetwode, wife of the C. in C., India, arrived at Croydon from Calcutta by K.L.M. on Wednesday of last week.

The new Fokker F22—a smaller edition of the F36 and with a distinct family likeness—which was illustrated in last week's *Flight*, will come to Croydon shortly, I hear, for demonstration purposes. It has passed its tests and now flies the Swedish A.B.A. flag.

A. VIATOR.

#### *The Rennes Services*

On January 8 the first service between Jersey and Rennes was run by Jersey Airways, Ltd. Two "Dragons," each with a full load, were used and Mr. L. T. H. Greig, a director of the company, was the only passenger not of the true "fare-paying" order.

#### *A Cardiff-Paris Service*

During this summer season Norman Edgar (Western Airways), Ltd., will run a week-end service between Cardiff, Bristol (Whitchurch), Le Touquet and Paris (Le Bourget). The seasonal Bournemouth service will, of course, be reopened in due course. Meanwhile, the Severn ferry service continues to run on demand.

#### *Japanese Line in Pacific*

Preparations for the opening of a fortnightly mail service between Japan and her Pacific possessions, it is learnt, are almost complete.

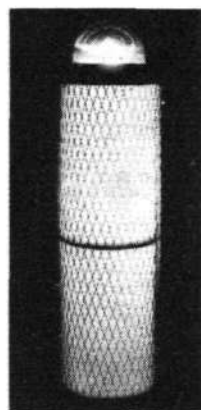
#### *A Norwegian Operating Company*

Early this year an Oslo shipping firm undertook the formation of an airline company, and it has now been announced that the Bergenske Steamship Company has joined the original firm, Fred. Olsen and Co., in a company to be known as Det Norske Luftfartsselskap Fred. Olsen og Bergenske A/S. The new company will probably receive sole concession rights from the Government.

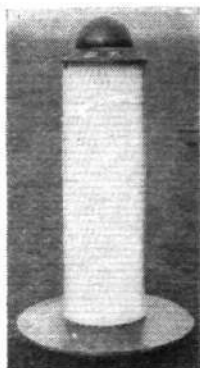


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## A FRENCH INTERNAL AIRWAY SYSTEM

*New Company to Operate a Postal Service between Paris and Other Important Centres*

**L**AST week the organisation of a new airline company was announced in Paris. Under the name of Air Bleu, it will run a rapid postal service between Paris and other important French cities. The company proposes to start operations with Caudron "Simoun" low-wing 3-4-seater cabin monoplanes. These machines have, it is said, a maximum speed of 195 m.p.h., a cruising speed of 168 m.p.h., and a landing speed of 46-49 m.p.h. They carry a payload of 640 lb., with a range of 845 miles. The engine used in the "Simoun" is the Renault "Bengali," which develops 180 b.h.p.

M. B. de Messimi, an associate of M. Pierre Latécoère, will be president of the new company, and M. Metral, a one-time member of the staff of General Denain, will be the technical director. A preliminary step towards acquiring the franchise was taken on January 8, when, on the recommendation of M. Georges Mandel, the Minister of Posts, the French Cabinet approved the project, which has now been submitted to the Chamber of Deputies and to the Senate for the necessary Parliamentary approval. The company hopes to start operating its system at the beginning of May.

According to latest reports, lines will be run for a start between Paris and Bordeaux, Toulouse, Lille, Strasbourg, Nantes, and Havre, with intervening stops. It is expected that the system will be extended and interconnected. No subsidies will be granted by the Government, but the Post Office Department will extend its aid to the new company to effect the rapid distribution of postal matter at the various termini.

Regular postal rates, it is said, will be charged, together with a surtax of 3 fr., of which sum 2 fr. is to go to the operating company and one to the Post Office. The name of the company is taken from the "petits bleus," used to send messages through the pneumatic tube system throughout Paris.

R. C. W.



The new mail lines which are to be operated by Air Bleu, using Caudron "Simoun" single-engined monoplanes with a cruising speed of 168 m.p.h.

### Atlantic Mail Disaster

Both pilot and wireless operator were killed when a Heinkel, carrying the South American mails over the last section to Germany, crashed on Lake Constance on Monday. The mail was saved.

### By Air to Majorca

On January 20 a daily seaplane service from Barcelona to Palma, Majorca, will be opened, and this will link up with the present daily service between Madrid and Barcelona. Another Majorcan extension will be made from Valencia, which is already connected by air with Madrid.

### Mails to the Isle of Man

Blackpool and West Coast Air Services, Ltd., have obtained the mail contract to the Isle of Man, and the first daily run will be made on February 1. Another D.H. "Dragon" will be used apart from that operating on the regular passenger service, which maintained a regularity of 97.3 per cent. during the eight months preceding the new year.

Olley Air Service, incidentally, will be taking delivery of their second charter D.H. 89 "Rapide" very shortly.

### Sixty Passengers, 200 m.p.h.!

Under the distinctly melodramatic title "Overnight to Europe," an American contemporary, *Air World*, describes Capt. Hugo Sundstedt's latest design for a long-distance high-speed machine which can only be described as a twin-float flying boat.

In brief, the machine is a high-wing cantilever monoplane with a two-storey hull having accommodation for sixty passengers. Two groups of engines, which are located in the wing and which can be reached in flight, operate two eighteen-foot three-bladed airscrews. Diesel engines of 4,500 h.p. are suggested as being the more economical over a long range. The long floats are integral with the fuselage.

The estimated performance figures are: Cruising speed at 10,000ft., 225 m.p.h.; maximum speed at 10,000ft., 245 m.p.h.; service ceiling, 21,800ft.; rate of climb at sea level, 930ft. per min.; range, with a payload of 14,600lb., 3,000 miles. The landing speed is estimated as less than 60 m.p.h.—a figure which appears to be slightly optimistic.

Wind tunnel tests have shown a high aerodynamic efficiency, a maximum lift over drag figure of 15.7 being obtained.

### Air Mails

A new air mail leaflet, giving particulars of all the services available from this country, has been issued by the Post Office.

### A K.L.M. Service in the West Indies

The Fokker F 18 *Snipe* of the K.L.M. will this month start her normal business of carrying passengers and freight in the Netherlands West Indies. The extra fuel tanks, which had been fitted for the Atlantic mail trip, have been taken out.

From January 14 to 17 the machine will make a trip to all the airports of Venezuela, and on January 19 the *Snipe* will open the first regular K.L.M. service in the West Indies, viz., from Curaçao to Aruba. The service will be operated on Tuesdays and Saturdays, twice in each direction.

### Indian National Airways' First Year

Surveying the work of Indian National Airways during the first year of operation, Mr. R. E. Grant Govan praised the reliability of the Rangoon and Dacca services, and stated that the revenue from traffic totalled 52 per cent. of the total operating cost. Increased frequency of service should bring better support from the commercial community. Mr. Govan complained, as we do here, of the injustice of the petrol tax which was designed to pay for the roads. It was reasonable, he said, that air transport companies performing, as they were, an efficient public service, should receive some financial support.

### Singapore's Aerodrome

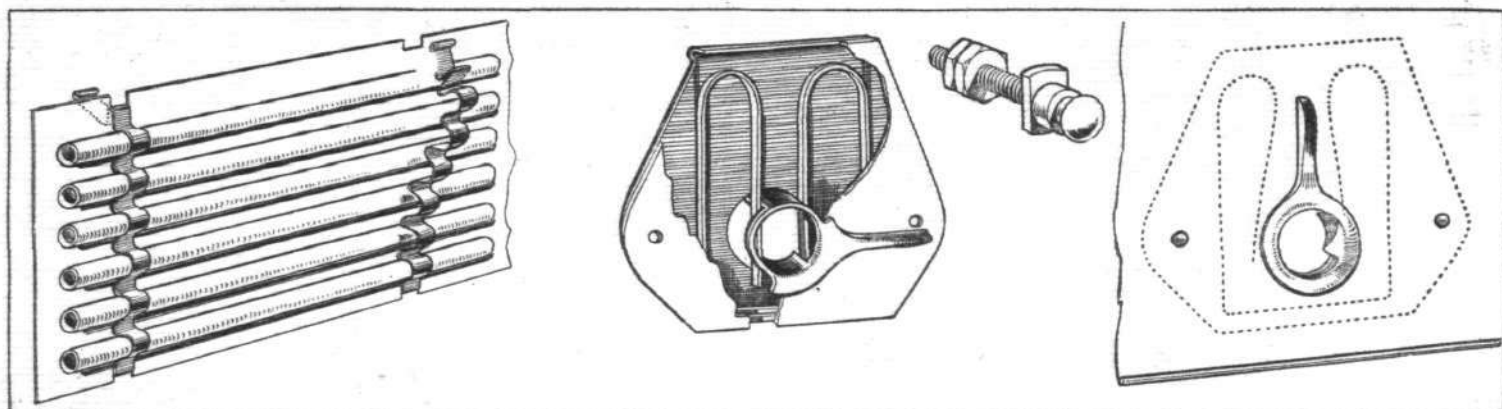
The new civil aerodrome for Singapore will be ready within a year, and Sir Shenton Thomas, the Governor, made his first tour of the aerodrome last week, accompanied by Sir John Salmond, of Imperial Airways, Ltd.

Built on land reclaimed from the sea, the airport is only ten minutes by car from the centre of the town, and should be the finest aerodrome on the Imperial air route.

Major Nunn, the Deputy Director of Civil Works in British Malaya, is spoken of as the first director of civil aviation in British Malaya, as it is understood that a department of civil aviation will shortly be set up, in accordance with the Government's policy of giving every possible support to aviation. Malaya will be the first country in the Colonial Empire to institute a special department for civil aviation matters.



## THE INDUSTRY



Two Simmonds "Aeroaccessories": On the left is the "Flexiclip," for securing cables, pipes and the like to the fuselage; on the right, divided into its chief components, is the simple cowling clip.

### SIMMONDS AEROCESSORIES

TWO recent productions of Simmonds Aeroaccessories, Ltd., are "Flexiclips" and cowling clips. Both are illustrated on this page. The former constitute an ingenious method of securing cables, pipes, etc., firmly in an aircraft, at the same time permitting quick detachment for inspection and replacement. The latter is a simple, yet positive and foolproof cowling clip of clean aerodynamic design at a reasonable cost. It consists of a small pressed plate (which is mounted on the cowling) containing a specially shaped spring engaging in a groove cut in a mounting stud secured to the aircraft frame. It is operated by a small lever or finger grip, which on being rotated forces apart the spring clip and thus releases the mounting stud. When mounted on a cowling panel all that is visible and exposed is the finger grip.

These two aeroaccessories figure in a new Simmonds catalogue which not only describes in detail, with many excellent sketches and photographs, the various specialised aeronautical and engineering accessories produced by this firm, but it also contains photographs of a number of different types of aircraft—British and foreign—which are equipped with the Simmonds-Corsey controls.

The latter, which has been fully described in *Flight*, is, of course, the principal item dealt with in this catalogue, and other accessories described include the Simmonds Elastic Stop Nut (this has also been described in *Flight*)—a lock nut extensively used in America in all branches of engineering, and recently approved by the British Air Ministry; Simmonds-Desmo rubber mouldings—petrol and oil-resisting protective covers for use on tappet rods, control levers, sparking plugs, etc.; Simmonds "Antivibro" footrests and flooring; Simmonds-Goudime navigational instruments (course and distance calculator, course and double-drift calculator, and the new automatic course and distance calculator); and finally, the Simmonds-Curry Weather Prophet, that simple little device invented by Dr. Curry, and described recently in *Flight*.

The address of Simmonds Aeroaccessories, Ltd., is Shell-Mex House, Strand, London, W.C.2.

### WELLWORTHY PISTON RINGS

Wellworthy, Ltd., the piston ring manufacturers, of Lymington, Hants, have now opened a new service depot for the northern counties at Millican's Buildings, Market Street, Newcastle-on-Tyne. They also have depots at London, Birmingham, Manchester (two), Bristol, Southampton and Glasgow.

### TECALEMIT WORKS DEVELOPMENTS

Building operations have been started at the Brentford works of Tecalemit, Ltd., the lubrication specialists, with a view to enlarging the store, office, and factory space available. A new bay extending the whole length of the works is being added, and a floor above this will in future accommodate the whole of the technical services of the company.

### AERODROME CONSTRUCTION

Anyone who is interested in the construction of aerodromes would do well to obtain a copy of the latest catalogue issued by En-Tout-Cas of Syston, near Leicester. It is well illustrated with aerial photographs of the many aerodromes which the company has prepared, and contains in addition a great deal of information about aerodromes in general.

### AN IMPROVED CIRRUS-HERMES ENGINE

Descriptive literature dealing with the improved Cirrus-Hermes IVa is now available in English, Spanish, and French. There are three brochures, one in each language, and any may be obtained by those interested from the works at Brough, where engines of this type are in production. The improved Cirrus-Hermes IVa is generally similar to the Mk. IV, which has given such excellent service, but now delivers a maximum of 135 h.p. instead of 130 h.p. as was formerly the case. The normal power is 120 h.p., and the weight complete 300 lb.

### A POST VACANT

The council of the Royal Aeronautical Society invites applications for the post of an assistant to the secretary. Applications in the first place must be made in writing, addressed to the secretary, and marked "Personal." Applicants should state their age and qualifications, and preference will be given to a young man with some knowledge of aeronautics and engineering. The appointment will be for a probationary period, with a view of a permanency at a salary of £3 a week.

### NEW COMPANIES

THE LONDON AIR PARK FLYING CLUB LIMITED (7, Park Lane, W.1). Nominal capital, £100 in £1 shares. Objects: To establish and maintain institutions for instruction and training persons in the science of aeronautics, and clubs for the benefit of pilots, observers or any persons connected with the aeroplane, airship, balloon or motor industry, etc. The first directors are:—Wm. B. Brady (permanent managing director), 10, Oxford and Cambridge Mansions, W. (director of Aircraft Exchange and Mart, Ltd., and Southern and Central Air Lines Ltd.), Harry W. Fulton (permanent), 10, Parkhill Road, Bex' Kent, with £100 and £50 each per annum respectively. Secretary: N. Pelham.

### INCREASES OF CAPITAL

WITNEY AND OXFORD AERO CLUB LTD. (6, Broad Street Place, E.C.) The nominal capital has been increased by the addition of £650, in £1 ordinary shares, beyond the registered capital of £100.

### PUBLICATIONS RECEIVED

*The Royal Air Force.* By T. Stanhope Sprigg. Price 5/- net. London: Sir Isaac Pitman & Sons, Ltd.

*Aeronautical Engineering Series Ground Engineers: Aero Engines ("D" Licence).* A. N. Barrett. Price 3/6 net. London: Sir Isaac Pitman & Sons, Ltd.

*Mechanical World Year Book, 1935.* Price 1/6 net. London: Emmott & Co., Ltd., 28, Bedford Street, W.C.2.

### AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m = motors. (The numbers in parentheses are those under which the Specification will be printed and abridged, etc.)

#### APPLIED FOR IN 1923

Complete Specification now open to Public Inspection. (Secret Patent Re-assigned to the Inventor.)

1427. BOULTON & PAUL, LTD., NORTH, J. D., AND BENNELL, A. F. Bomb gear for Aircraft. (421,263)

#### APPLIED FOR IN 1934

Published, January 17th, 1935.

11984. COMPAGNIA NAZIONALE AERONAUTICA. Planetary reduction gearing for radial aeroplane engines. (421,438)

# FLIGHT

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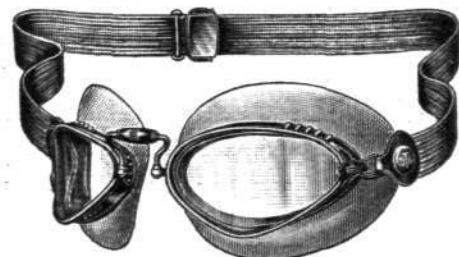
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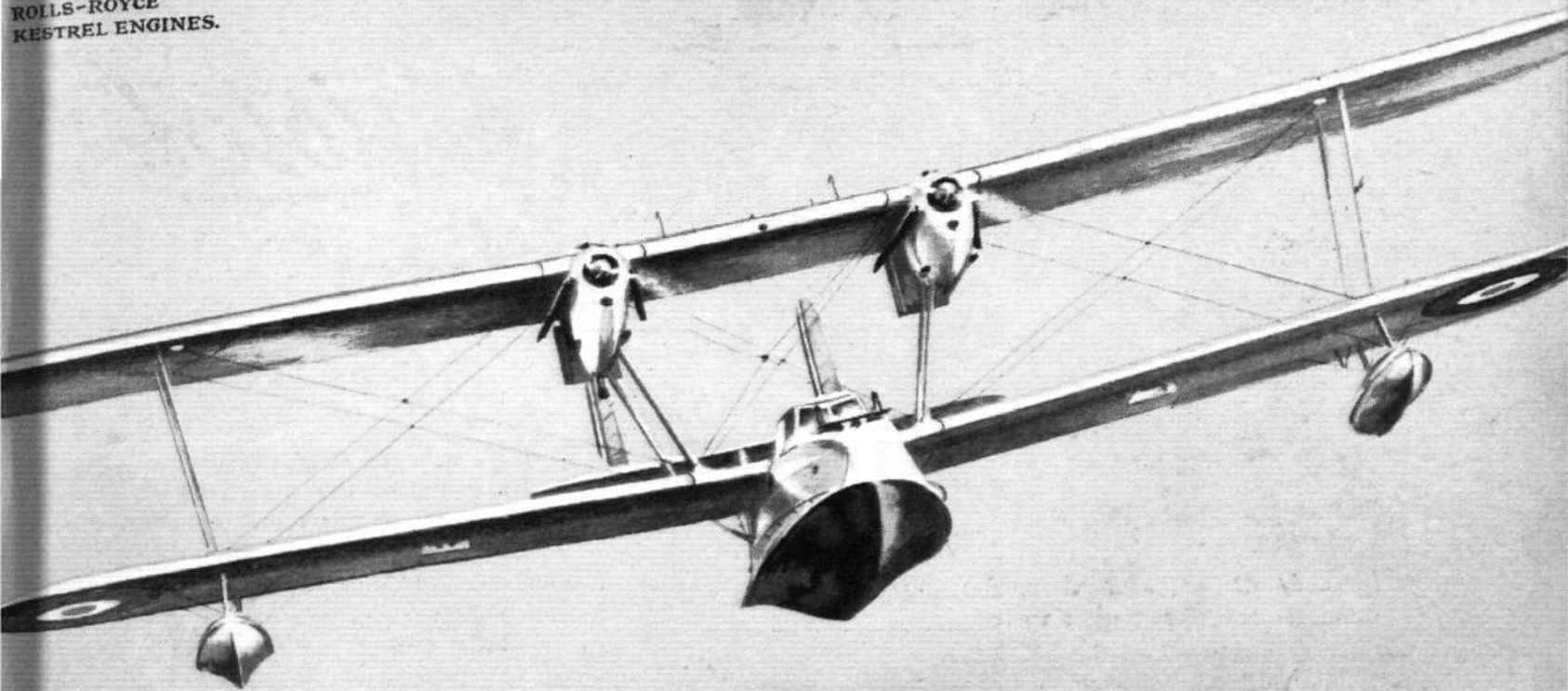


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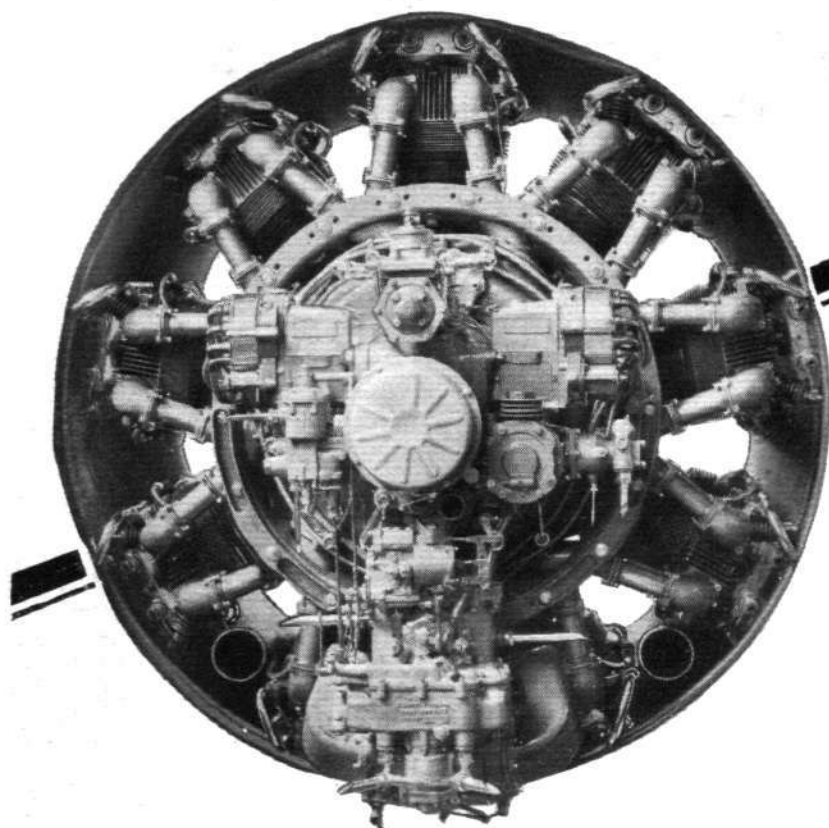
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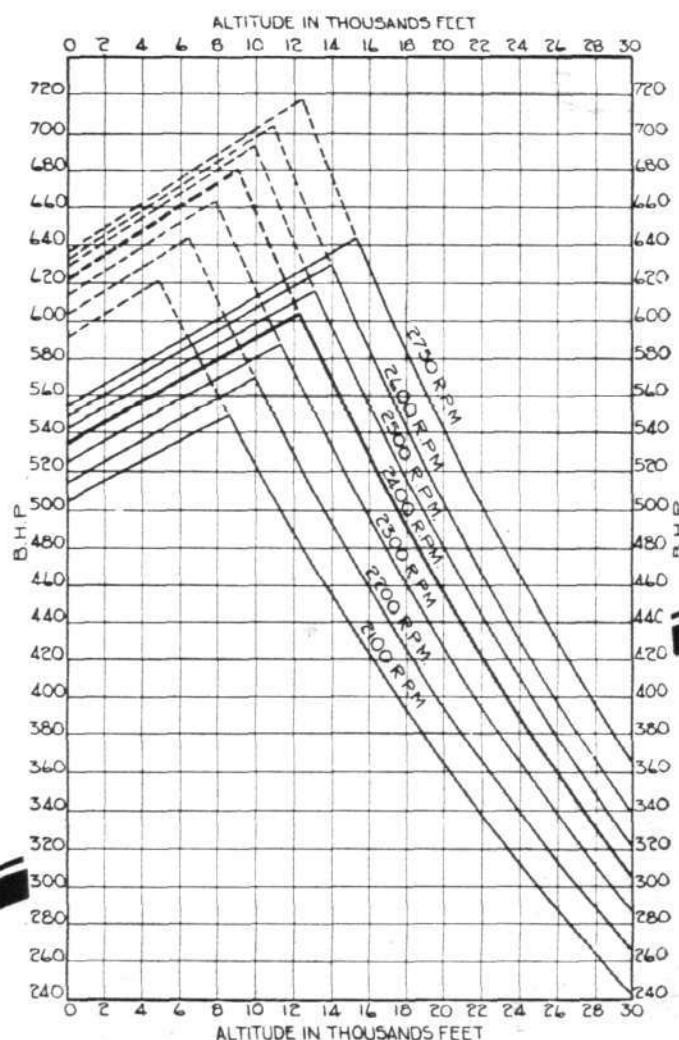
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